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Speeding Up Manufacture of Machine Tools

New Equipment and Working Overtime Common Expedients—Considerable Additions to Shop Space—Danger of Over-Expansion

From eighty-seven replies by machine-tool builders in response to requests for information, THE IRON AGE is able to present an illuminating summation of present conditions in the machine-tool industry. The letter of inquiry sought to ascertain the extent to which production facilities have been increased by additions to manufacturing space, the purchase of new machinery and equipment, and increases in working time. Many of the replies not only answered the questions asked, but threw light on other phases of the subject, some sounding a note of warning on the danger of over-expanding shop facilities. Out of the eighty-seven firms replying forty-nine stated that they had bought additional machinery to meet increased demand, ten said that shop additions were under construction, seven that they had recently completed additions, and eight that they contemplated building.

Several tool builders who have not enlarged their plants or bought additional machines have nevertheless increased their production by employing more men and working overtime. Many have augmented their output by having parts made in shops ordinarily engaged on other kinds of work. Only a few manufacturers of tools, as the letters indicate, have brought out new machines in recent months; many have rather cut down their lines in order to concentrate on the machines for which the demand has been greatest, in some cases practically overwhelming. Those who have undertaken to turn out special machines required for the manufacture of munitions do not expect to continue such work after the present emergency has passed. That getting a sufficient number of good mechanics is a serious phase of the situation is pointed out by several of our correspondents. A few do not attribute their increased activity to war orders.

Below is given a selection of extracts from the replies each preceded by a type of machine tool manufactured by the firm in question:

WHAT SOME BUILDERS HAVE DONE

Lathes.—We have added quite largely to our manufacturing equipment; additional equipment now on order will still further increase our facilities, the total approaching a 50 per cent increase. During this period we are endeavoring to decrease rather than increase our line of machine tools.

Lathes.—Roughly speaking, we have purchased $75,000 to $80,000 worth of new equipment in order to increase our output.

Lathes.—The output of engine lathes has been increased since the war started from considerably below normal to just as much in excess of normal as the manufacturers can operate. Our to-day's output is perhaps 40 per cent above normal. We have not added to our manufacturing space and do not intend to do so. We have purchased some new equipment.

Milling Machines.—We are increasing our facilities by an addition to our factory and by the installation of added equipment, and thus, by also operating a night force, we have probably increased our normal facilities about 100 per cent in the past three months.

Turret Lathes.—We are at the present time adding to our shop about 15,000 sq. ft. We have bought a number of new tools and expect to increase our output very materially.

Automatic Screw Machines.—At the present time we are erecting a new building which will materially increase our manufacturing space. This addition was planned some eighteen months ago. We have purchased some new equipment for this building and will probably be in the market for some additional tools about the time the building is completed.

BETTER METHODS DOUBLE OUTPUT

Drilling and Boring Machinery. —By rearranging, jigging and systematizing and by the addition of a few machines we have practically increased our capacity by at least 50 per cent. We have now passed our production of last year, which was the best year up to that time. The war has had very little effect on us, although we are doing some special work along the line of drilling and tapping machines.

Drilling Machines.—We are working day and night forces.

Gear Cutting Machines.—Our business has increased very rapidly in the last two or three months, and we are now sold several months in advance. We are considering increasing our manufacturing space about 33 1-3 per cent and are purchasing a few new tools.

Screw Machines and Turret Lathes.—Since the first of the year we have practically doubled our plant and output.

Drilling Machines.—We have added somewhat to our machinery equipment in the last few months, but probably not to exceed 10 per cent. We are, however, running double turn and are having some work done in outside shops.

Grinding Machinery.—We have added to our working force and are working full time. Our present business compared with a year ago is more than double.

Special Machinery.—During the past nine or ten months we have added equipment which has nearly doubled our capacity in two or three departments and are now figuring on a new addition to our works.

Drilling Machines.—By the addition of new tools and taking up night work we have added about 50 per cent to our production. We are contemplating a new building for our machinery department and also a building for our foundry.

CAPACITY FOR AUTOMATICS MUCH INCREASED

Special and Automatic Machinery.—We have been very much crowded with business so far this year, while we are at present adding to our manufacturing space a little over 100 per cent.

Automatic Threading Lathes.—While this company has not added any new buildings it is increasing its tool equipment to the extent of about 25 per cent by the purchase of standard tools, lathes, planers, milling machines and boring machines.

Presses.—Our facilities have been increased by the addition of about 50 men since spring. We have not added to our manufacturing space, but are considering expansion along this line.

Planers and Lathes.—We have bought considerable machinery, put a small addition on our machine shop for a shipping room, and have extended our foundry.

Presses, Dies, Etc.—We are contemplating an addition to our shops, in which case a full equipment of heavy machine tools will be added.

Hydraulic Machinery.—We are increasing our machine shop. We have also purchased several machine tools and are running the majority of our larger tools day and night and practically the whole shop until 9 o'clock at night, with the result that our output is approximately 40 per cent above normal capacity.

Grinding Machinery.—We have increased our production from about 40 hr. a week to 72 hr. and the help from about 40 to 78 in the last four months.

Shaping and Milling Machines.—We have increased our capacity about 25 per cent by installing new machinery.

Milling Machines.—Since Jan. 1 we have doubled our equipment and more than doubled our output. We now have in course of construction a factory building that is a duplicate of our present building.

Broaching Machines.—We are very busy operating with an increased force and working as much overtime as possible. We are contemplating an addition to our factory.

Automatic Screw Machines.—Our greatest increase is due to working overtime, thus leaving us our regular plant when the rush is over.

OUTSIDE WORK FOUND UNSATISFACTORY

Lathes.—We have not been carried away with this business. We have taken the opportunity of replacing considerable old equipment with new and up-to-date machinery. We have bought a little additional equipment. Most of our increased output is due to our placing considerable detail work in outside shops. This we find, in the main, unsatisfactory, as the price is high, and in many cases the work is not up to our standard. We are contenting ourselves with such business as we are able to produce in our own shop, and we do not intend to load ourselves up with a large increase in factory space and equipment. Of course, new equipment means an improvement over old, and it might be fair to say that our increased efficiency from this source is about 25 to 30 per cent.

Grinding Machinery.—We are running our plant both day and night, and have purchased some additional machine equipment enabling us to just about double our capacity. We have under consideration an addition to our plant which will enable us to about double up again.

Shapers.—We have developed about 20 to 25 per cent increase in our capacity and are gradually adding to this.

Bolt Cutting and Pipe Threading Machinery.—We have found a decided picking up in business since the first of January. Each month sees a little advance in machine tool requirements. We do not contemplate any additional building at the present time. It is more a case of getting competent men to do the work.

A FIRM WHICH DELAYED IMPROVEMENTS

Metal Working Machinery.—We have for some time past been expecting to make material additions to our plant and have purchased a large tract of land. Our plans for these buildings have been prepared, but the depression in our own lines, and in general, induced us to put the matter aside for the present. We could not have carried out our plans in time for the present emergency, nor have we purchased new equipment therefor. We are building some new lines of tools which will hardly be permanent with us.

Grinding Machines.—We have received a large volume of orders for our product, far beyond our ability to give prompt deliveries. While we are considering and planning for a considerable addition to our works and equipment, we are not doing it on the strength of our present business, but due to the fact that the natural growth of our business seems to warrant additional capacity in the very near future.

Among the expressions of opinion that caution should be exercised in expanding to meet present demands were the following:

DANGER OF CREATING EXCESSIVE OVERHEAD

Metal Working Tools.—With the last year we have increased our output about 110 per cent. We have, of course, added some machine tools to our equipment, but the increase was largely made by having machine work done in about a dozen different machine shops in this vicinity, and adding to our vise and fitting-up force, which, of course, did not require anything but benches, vises and small tools. We have not believed that the present spurt in the machine-tool industry warranted any very large permanent increase. In fact, we think a note of warning to all machine-tool builders should be sounded, as present conditions are so tempting that manufacturers are liable to increase their plants to such an extent that the overhead will indeed be a burden when normal conditions resume. The machine-tool business, unfortunately, has always been one of unusual ups and downs, and it is quite impossible to have one's plant large enough to satisfy the demand on the high peak. We firmly believe that we will have to reduce very much our manufacturing operations after the present rush is over.

Turret Lathes.—About the middle of December we resumed full time and have since been steadily increasing our force. We are operating a night gang and at least half of the day force is working three evenings a week as well. We have purchased ten or a dozen machine tools to balance our equipment. We do not think it advisable to spend large sums in extending our plant and equipment, as we feel there is danger of over-confidence in this matter.

Lathes.—We do not believe under the present conditions it is wise for any of the manufacturers to purchase additional equipment. It has been hard to obtain skilled men to operate the machines now in our shop.

ONE FIRM SEES BUSINESS UNCERTAINTY

Metal Working Tools.—For some time business was dull and our plant was not run to its capacity. Since February, however, we have run at full capacity. The uncertainty in business at this time does not warrant our increasing our plant.

Cutting-off Machines, Etc.—We have purchased new machinery and are now concentrating our efforts on cutting-off machines and turret lathes.

Several other firms advised that they had increased their facilities in one way or another; still others said they had not done so and had no such intention. Another wrote: "We have not increased our space or equipment, but are running what we

have full force and overtime. We do not feel that the present rush due to war orders calls for any great increase in our shop."

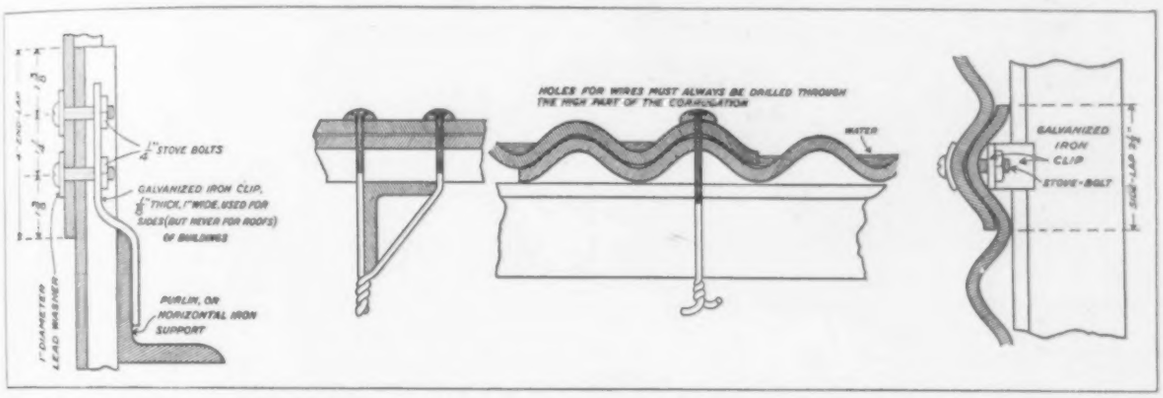
One reply stated that additions to shop capacity had been hindered by delayed deliveries of machinery ordered, and another that many manufacturers probably would be glad to add to their plants if it were possible to secure a sufficient amount of help of the right sort. The writer added: "We can get plenty of help, but it takes time to educate them. Apparently this demand for machinery, due to the war, will continue for some time."

Corrugated Asbestos Roofing and Siding

After ten or twelve years of experimenting the Keasbey & Mattison Company, Ambler, Pa., has brought out a corrugated asbestos roofing and siding. This marks the final step in the process of development which first took flat sheets of asbestos building lumber and bent them while soft into the corrugated form, one corrugation at a time. This was afterward supplemented by the placing of iron wire mesh or screen between the layers of asbestos to give the material greater tensile strength. It was found, however, in some cases where the material was exposed to corrosive fumes or to salt air that sufficient moisture would enter through minute fissures in the convex side of the corrugations, ultimately causing the reinforcing material to disintegrate. The process of manufacture was then modified so that the material could be compressed while in the corrugated condition, a pressure of approximately 100 tons per square foot being employed. The resulting product, it is emphasized, is a dense and thoroughly compacted structure that will withstand rough treatment and not be affected by weather influences.

In making this material the Hatschek process, which is the invention of Ludwig Hatschek, an Austrian, is employed. Hydraulic cement is first thoroughly mixed with water and asbestos fiber in a beating engine similar to that employed in the manufacture of paper pulp. Prolonged, vigorous mixing and agitation to which the material is subjected results, it is claimed, in the formation of uniform pulp having the properties of a colloidal solution, one of which is that small solid particles will remain in suspension indefinitely. The material then passes to the vat of a modified paper machine, where it is kept in a state of agitation until picked up in thin coatings by a fine wire screen on a revolving cylinder, from which it is passed by an endless felt belt to a second rotating cylinder, upon which it accumulates in layers until the desired thickness is secured. The material is then cut across and removed in the form of sheets, which are piled one upon another and placed between metallic plates. These are subjected to heavy pressure to compact the material, drive out excess water and eliminate all voids and fissures. The numerous layers provide for the crossing of the asbestos fibers in all directions, which, it is emphasized, gives the finished material a texture of great homogeneity and toughness. The corrugated sheets are made with a uniform width of 27½ in., or eleven complete corrugations, and in lengths ranging from 4 to 10 ft. The corrugations are 2½ in. wide and 1 in. deep from top to bottom of the corrugation. The material varies in thickness from 3/16 to 5/16 in. and weighs from 2.8 to 3 lb. per square foot.

The method of applying and supporting the material for roofing and siding purposes is shown in the accompanying drawings. The roofing is lapped two corrugations sidewise and 6 in. endwise, the inclined joints in succeeding courses being staggered from those of the perceding ones by the amount of the side lap. The supporting purlins are spaced so that the maximum distance between them is not more than 36 in. for roofing and 40 in. for siding. The method of attaching the roofing sheets



Drawings Showing the Method of Fastening the Corrugated Asbestos Roofing and Siding in Place on Purlins

to steel and iron framework that is recommended is aluminum tie wires. Two holes are drilled through the asbestos, one just above and the other just below the purlin, the holes being located in the tops of the corrugations and made no larger than is necessary for the passage of the wire fasteners. The outer end of each tie wire has a head similar to that of a wire nail and holds a soft lead washer. The inner surface of the washer and the head of the wire are daubed with plastic asbestos cement before the wires are drawn up against the roofing, the inner ends of the wires being twisted together around the purlin as shown in the illustration. Iron wire nails with lead washers are substituted for the aluminum tie wires where the material is to be applied to wooden purlins. Where siding is used the arrangement for fastening is somewhat different. Here a galvanized iron clip bent so that the inner end rests over the purlin or other horizontal iron support is employed. The clip itself is fastened to the material by two ¼-in. stove bolts, the heads of which are outside of the siding and rest against soft lead washers. As is the case with roofing, nails are used for fastening the siding to wooden framework.

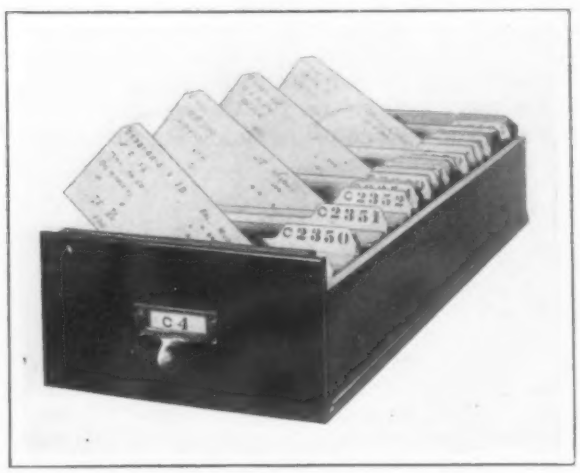
For protecting corners and ridges, rolls of the same material are employed. The corner protective devices are half cylinders made in lengths of 16, 42 and 56 in. and applied so that the ends overlap. The ridge rolls have 6-in. wings which overlap the corrugated roofing. To enable the ridge roll to be applied to any peak or angle, it is made in two parts, the half cylindrical ones turning one within the other to provide the desired angle for the wings.

Machine Accounting in a Pump Works

How Tabulating Machines in the Worthington Plant Effect a Saving in Clerical Expense Reckoned at Twice Their Cost

BY SIDNEY G. KOON

"In addition to the extensive and important data made available, the application of tabulating machines to the cost accounting system, at the Worthington Works, has resulted in a saving of clerical expense amounting to at least twice the cost of the machines and the special stationery used in connection with them. The indirect savings due to the utilization of the complete data made available by these machines are many times their cost."



A Section of the Open Order Files in Which the Punched Time Cards from the Several Departments are Placed Pending the Completion of the Work

This quotation, in a communication from George R. Townsend, general manager of the Henry R. Worthington Hydraulic Works, Harrison, N. J., tells in brief what the Hollerith tabulating system is doing for that company in the preparation of regular daily, weekly and monthly reports, as well as in special studies of particular features of the business. It is also found possible, with a very small amount of labor, to obtain any kind of analysis required, whether relating to prices, costs, profits, stock, or what not.

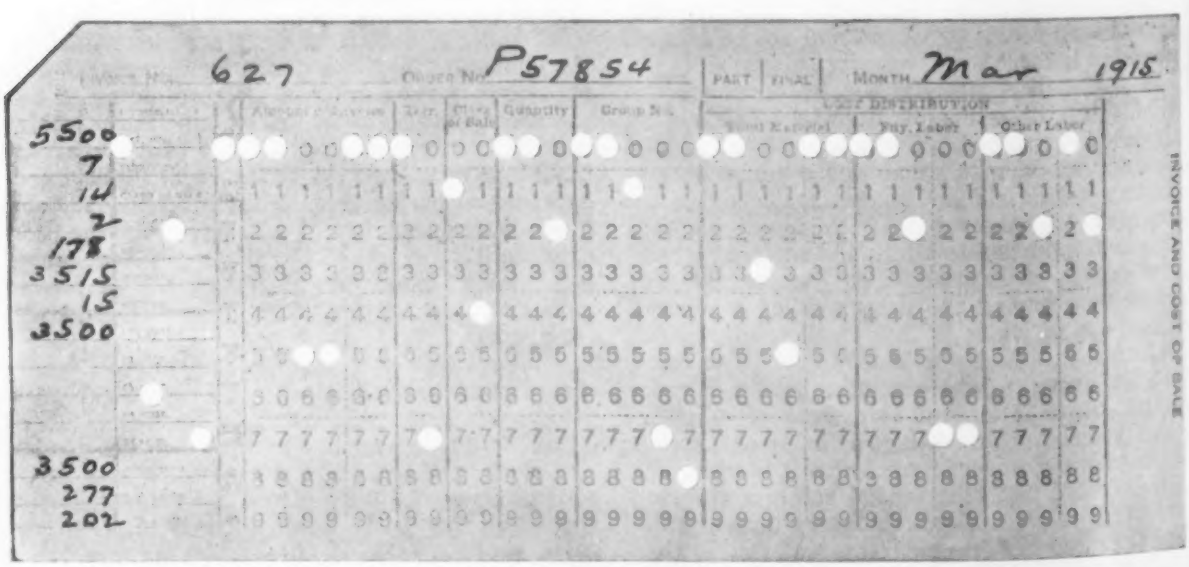
The system covers the application of punched cards to all stock, labor, production and sales records, what is known as a dual card being used. The left end of the card receives the original written entry in properly arranged form, while the right end, laid out for punching the holes, repeats the data written at the left. This makes of each card a complete record which can be traced back to the original source, and at the same time can be used immediately in the machines for any analysis required.

The Worthington factory cost accounting system has been developed, along the lines to be described, for the following purposes:

1. To determine the total net factory profits of the company promptly and accurately at the end of every month.
2. To determine the value of inventories, both in total and as to important details, at the end of every month.
3. To obtain a monthly statement of sales by sales territories, showing not only the volume of business invoiced to every sales territory, but also the corresponding total factory profits developed from such business.
4. To obtain a similar statement for every sales territory and for every class of machinery covered by the business invoiced.
5. To obtain a statement once each month showing comparative prices obtained in every sales territory for every item of product.
6. To obtain a statement once each month showing comparative factory costs of every important item of product.
7. To determine the exact factory cost of every machine built.
8. To determine the exact factory cost of each part of every machine built and of each operation on every part.
9. To determine and to have reported weekly the standard labor value of the product of every department, and the corresponding actual expenditures for labor on this product, together with the total saving and percentage of saving effected. (In explanation—each operation on every item of product is given a standard labor value, carefully determined before the first order for the work is issued to the shops. Thereafter the standard labor value remains unchanged, regardless of savings effected. The difference between labor value of product at standard rates and the actual expenditure for labor on the same product, when the latter is less than the former, indicates a saving due to increased efficiency. The percentages of saving in each department every week are the figures determined for this classification.)
10. To secure a monthly statement giving a complete classification and comparative analysis of the cost of all items comprising factory burden or overhead.

ACCOUNTING FOR STOCK

All material drawn from stock is entered upon the dual card or order form shown at the top of the group engraving, which is known as the stock dis-

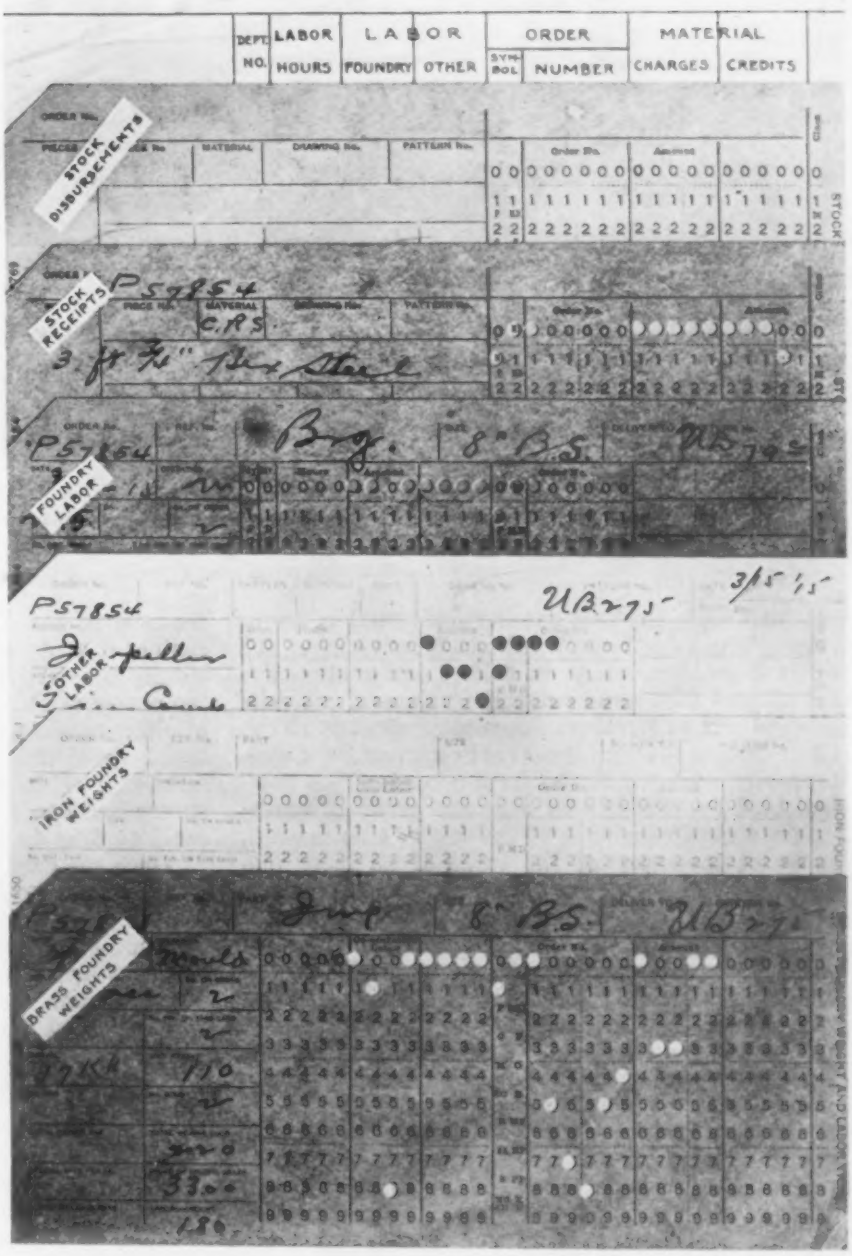


A Typical Card Upon Which All the Data Regarding the Cost of an Order Are Entered after It Is Completed

ursement card. This card, which is of deep orange color, arries complete information egarding the character and umber of pieces to be issued. For standard stock parts the nformation required is print- d upon the cards, thus call- ng for very little writing. This arrangement both elimi- ates clerical errors and saves ime in the issuing of orders or material. It is especially aluable in the case of orders or repair work, which in ost cases call for stock ma- erial and must be handled uickly. About 35,000 of hese cards each month, or ractically 1400 per day, are ssued by the engineering de- artment as needed.

A similar, but green, form ares for stock receipts, whether materials returned to tock after having been drawn ut, or materials purchased nd put into stock. About 00 of these are handled each onth.

Where the order for mate- ial calls for castings from the ron foundry, a brown form is sed, about 5000 cards being equired per month. For astings from the brass foun- ry a blue ticket is used, as hown at the bottom of the roup. As no material is is- ued except on one of the orms shown, a perfectly ac- urate material cost record is btained from their use.



Some of the Cards Used in the Mechanical Cost System. It Will Be Noticed that the Order Number Is in the Same Position on Each of the Cards

ACCOUNTING FOR LABOR

Foundry labor and other abor are kept separately, on ards which differ only in de- ail. Foundry labor is re- orded on a red card, of which bout 8000 are used each month; other labor upon a ellow card, using 30,000 per month. The time in ll the shops is kept directly upon these labor rec- rd cards, one of which is provided for each man nd each operation. As soon as the operations in department are completed for a lot of parts, the me card is collected by the labor department, ated and extended. The cards are then punched nd immediately aggregated on the tabulating ma- hines for returns from each department.

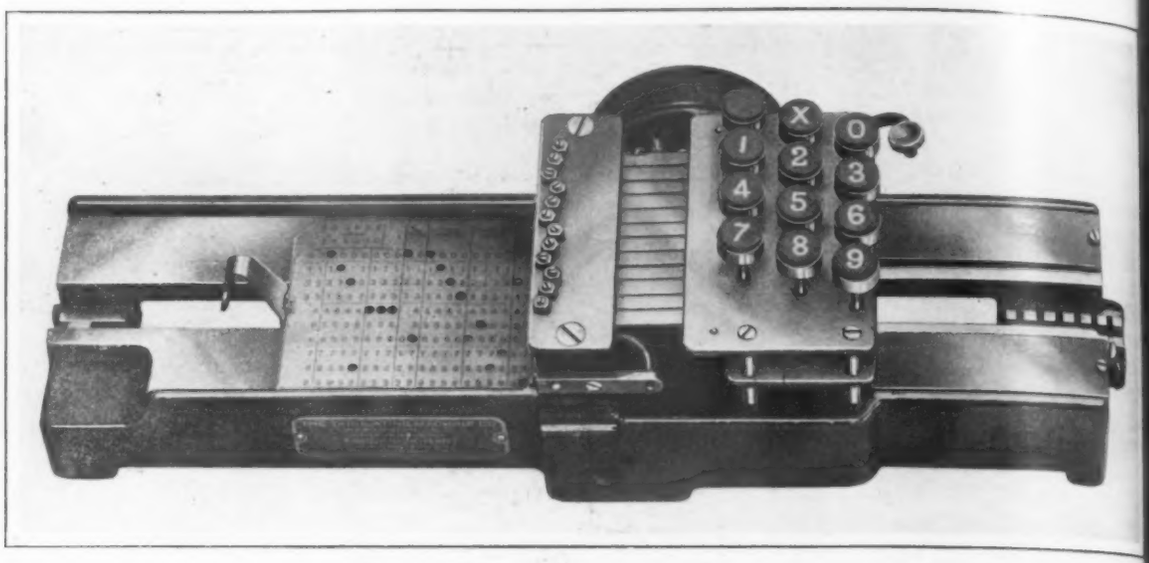
A corresponding list of completed orders for ork is kept in each department, being turned daily nto the labor department for rating and extending t standard labor values. Comparison between the otals of standard labor values and actual labor costs s then made, to determine the daily efficiency of ach department, and to locate immediately all items howing excessive cost. This makes it possible to orrect any tendency to undue cost before it has one far enough to do much damage—something lmost out of the question in any other method of andling the information.

After this daily summarizing, the time cards, orted in the sorting machine according to order umbers, are placed in the open order files. These files thus show, under each order or account number, all charges against that number, whether for material purchased, material disbursed from stock, castings made or for labor of any kind.

MAKING UP THE REPORTS

Referring to a complete set of cost cards forms, as shown in the group engraving, it will be noticed that the order number is in the same vertical column on each of the six cards, and all other items calling for the same data are placed in columns similarly located. The advantage of this lies in the ability to sort out all of the cards for any order number by the same setting of the sorting machine, no matter what these cards may represent. Only one cost record file is needed, and the setting of the tabulating machine for the various items remains the same from one month's end to the other; because each item is always in the same location, and the machine will record it in the same way, no matter which card is used.

By running through the tabulator all of the six types of cards on any order number, or any desired group of orders, the simultaneous additions of amounts are all segregated. Thus, in the five-counter



The Machine Employed to Punch the Cards. It Operates Like a Typewriter by Depressing the Numbered Keys at the Ri and Has an Escapement Like a Typewriter Carriage

machine used, the first counter adds total hours of labor. The second and third add foundry labor and other labor, separately, in dollars and cents. The fourth and fifth accumulate the values of material charges and material credits, also separately. Thus all of the required information is aggregated simultaneously, and in just the form needed. This is all indicated by the heading over the group of cards.

As a single instance of the use of this method, an exact inventory of the value of all labor and material represented by open orders is obtained once a month simply by running through the tabulating machine all the cards in the open order file without necessity for sorting of any kind.

When an order is closed, a card showing invoices and cost of sale is furnished the cost department by the billing department. Upon this card the billing department enters the information under the headings, invoice number; order number; amount of invoice; territory; class of sale; quantity and group number. The latter term indicates the size and style of machines covered by the sale. By "class of sale" is meant a general classification such as centrifugal pumps, condensing apparatus, water meters, etc.

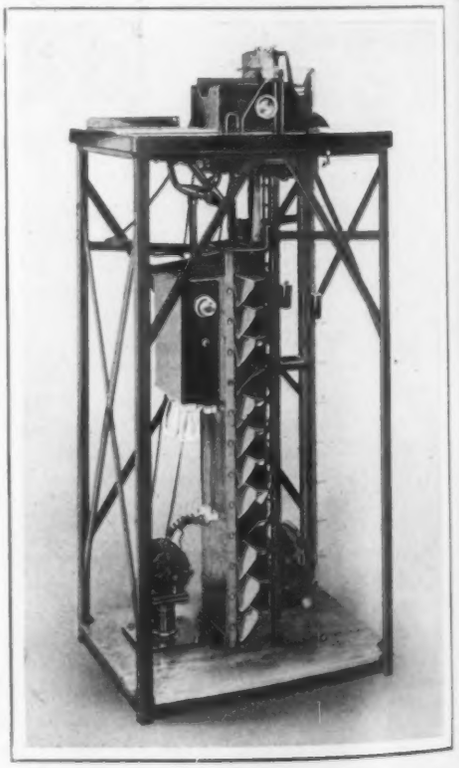
The record cards from the open order files are then put through the tabulating machine by the cost department to secure the total costs, as already explained. These costs are posted on the invoices and "cost of sale" card, and the data punched on the right end of that card. The total sales, costs and profits are secured at the end of each month for the various classifications of sales by sorting these cards, according to the classification desired, and then aggregating on the tabulator the figures for each classification.

MACHINES USED WITH THE CARDS

The method by which these cards are handled in the machines is simple once the details are mastered. The punch used in perforating the cards has twelve keys like those on a typewriter, and is operated in the same way. The escapement, which carries the card from column to column, as a hole is cut in each, operates just like a typewriter, and the punching is very rapid.

These cards, with their round holes cut in them, are then passed through the automatic sorting machine, in which a flexible wire brush is pressed against the card, in a position corresponding to the column which is the basis of the sorting. When the hole in the card passes over the brush electr contact is made which opens a magnetic switch a shunts the card into one of the pockets shown the center of the sorting machine illustration. T machine operates at the rate of 250 cards per mi ute, a speed which the eye cannot follow with a certainty. It works with unerring mechanical a curacy and can handle more work of this sort th could be done by a dozen clerks.

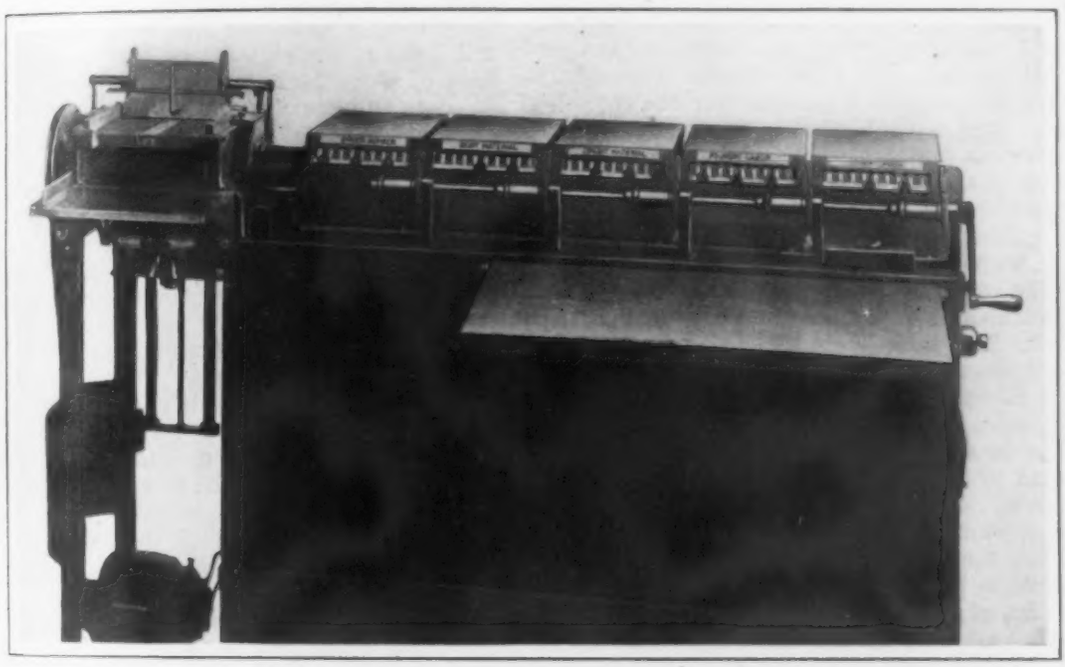
Once the cards are sorted into groups they a run through the tabulating machine at the rate 150 per minute. This machine provides a contin ous running total of the amounts under five separa headings simultaneously, thus giving in effect, u der maximum working conditions, 750 totals p minute. This operates on the same principle closing an electric circuit through the hole in t card, thus actuating a magnet connected with t counters.



The Automatic Sorting Machine Which Operates at a Speed of 250 Cards Per Minute and Picks Out the Cards Having Entries That It Is Desired to Tabulate

Long experience, involving the handling of millions of these cards, has shown that the errors in preparation of cards, in sorting and in aggregating are a mere fraction of those experienced in hand work. The cards may be sorted and analyzed over and over again, all from the same original data, because a card once punched never changes. Compare this with transcription of hand-made records from one analysis to another—the frequent errors, transposition of figures, omissions or duplications of amounts—all of which are absent in the mechanical method, and it is apparent how the latter gives results upon which such implicit reliance can be placed.

When, in addition to these features, monthly and other reports can be obtained sometimes a whole week ahead of the best results of hand labor, and at lower cost, the value of the machines for cost and other accounting is made very evident. And for special analyses, called for all of a sudden, wanted immediately and perhaps never repeated in exactly the same form, the machines are of inestimable value. The data are already on the cards. All that is required is the selection in the sorting machine of the proper group of cards, and then the aggregation of their amounts on the tabulator. In many cases, where a report of this sort has been obtained within two or three hours, the amount of work involved in a hand-made report would have required several days and a prohibitive expense.



The Automatic Tabulating Machine Which Will Handle 150 Cards Per Minute and Give 750 Totals in the Same Period, as Additions Under Each of the Five Heads Are Made Simultaneously

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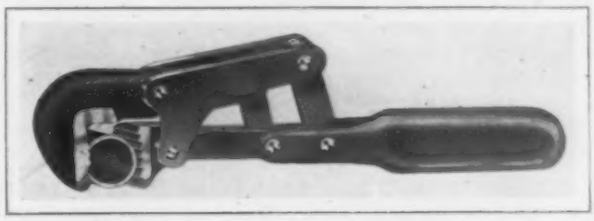
The salesmen of the Keystone Steel & Wire Company, Peoria, Ill., recently held a convention which occupied three days, the greater part of the time being consumed in addresses on practical subjects by officers of the company. It is stated that the company has refused to bid on orders for 100,000 tons of barb wire for war purposes. A new factory, 80 x 250 ft., for the manufacture of gates, is in course of construction.

Russian grain crops for 1915, according to data furnished the U. S. Department of Agriculture, are estimated as 301,508,000 bushels of winter wheat and 941,736,000 bushels of winter rye, increases over 1914 of 20.3 and 19.6 per cent respectively. The figures refer to European Russia except Poland.

Combination Wrench for Pipes and Nuts

An automatic combination self-adjusting pipe and nut wrench has been brought out by the Hayward Wrench Company, 700 Cass Avenue, St. Louis, Mo. One of the features upon which special emphasis is laid is the ease with which the wrench can be adjusted to any size of pipe or nut within its capacity.



A New Combination Wrench for Pipes and Nuts Having a Somewhat Special Type of Gripping Mechanism

The gripping mechanism is of a somewhat unusual type, both jaws being actuated from the handle through a series of links and levers. It is pointed out that the greater the force applied to the handle the tighter the pipe or nut is gripped, but the former is not crushed. A quick release and a ratchet movement are also provided, which in combination with the automatic adjustment make it easy to handle pipes or nuts. The pins on which the various members of the wrench turn are protected with a view to eliminating chance of clogging with dirt or grease. All of the parts of the wrench are high carbon steel drop forgings. Three sizes with maximum openings ranging from ¾ to 1⅞ in. are made.

Bolivia's output of tin for 1914, according to data just published, was 36,263 metric tons, calculated on a tin content of 60 per cent in the Bolivian concentrates. The output in 1913 was 44,595 tons and in 1912 it was 38,379 tons.

Imports from Germany into the United States for May, 1915, were only $3,172,630, compared with $14,661,923 in May, 1914. The largest item was toys at $447,976, the next being earthen, stone and china ware at $225,758.

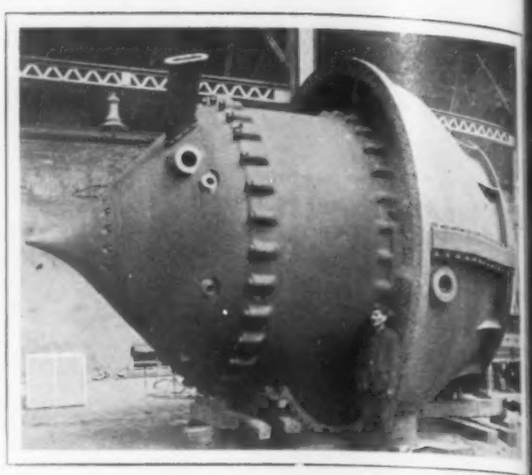
TWO LARGE HYDRAULIC VALVES

Twelve-Foot Units Weighing 90 Tons Regulate Admission of Water to Turbines

Two hydraulic valves that are believed to be the largest valves of any type ever made have recently been built by the Wellman-Seaver-Morgan Company, Cleveland, Ohio, and are being erected in connection with the Oneida development of the Utah Power & Light Company, Salt Lake City, Utah. These are 12-ft. valves of the Johnson type, several of which in smaller sizes have been installed in similar plants. They operate under a head of 140 ft. and are installed in riveted steel penstocks in the valve chamber just outside of the main power house. They are located close to the turbines which are supplied by these penstocks and are operated by penstock pressure. The turbines have an output of 10,000 hp. each.

The valves consist of a plunger that moves in a large internal operating cylinder. A portion of each cylinder is cast integral with the outer casing, and the barrel of the cylinder is bolted to that portion. On the rear end of the cylinder is mounted a dome which serves as a deflector for the incoming water as well as a head for the cylinder. The plunger has a shoulder at its end so that there is a difference in its diameter and this forms an annular chamber when the plunger is assembled with the internal cylinder. Admission of penstock pressure into the annular chamber causes the valve to open. When the control valve admits pressure to the annular chamber it discharges the water in the large chamber. The valve is closed by the admission of penstock pressure into the cylinder, the water pushing the plunger forward.

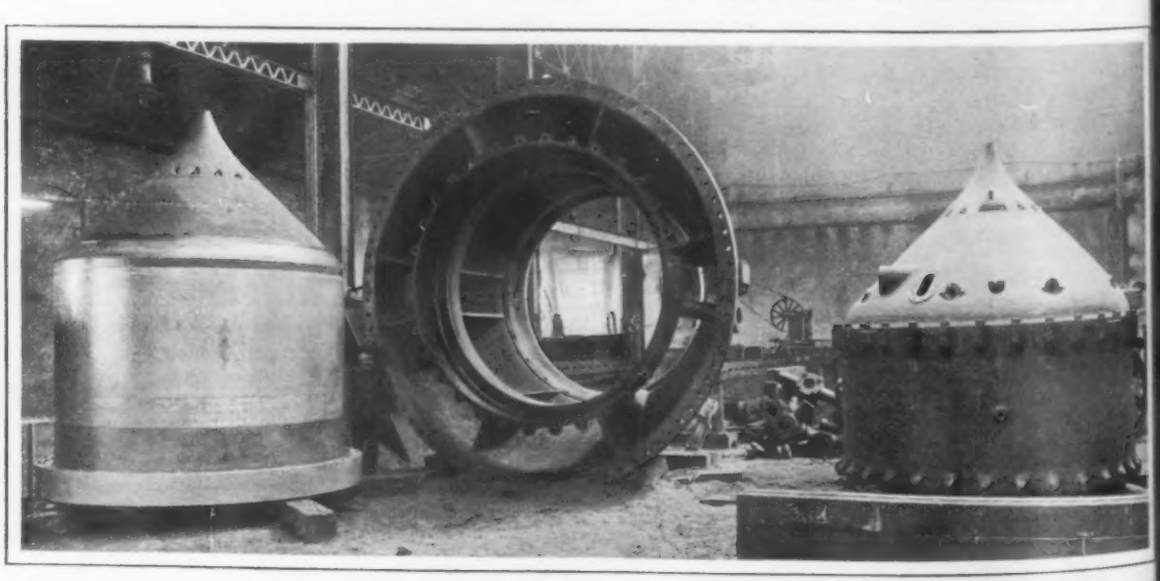
The valve body is a steel plate section that is bolted to the discharge section, and at the other end is riveted to the penstock. The smaller of the accompanying illustrations is a shop view of the valve, this photograph being taken before the body had been bolted to the discharge section as shown at the right. The porthole in the discharge section at the right is the admission port for opening the valve and the discharge port when closing it. The admission port for closing and the discharge port for opening are shown at the left at the top of the dome in this illustration. Both of these ports are 8 in. in diameter. The larger opening just below this port is for the indicator shaft to show the position of the valve at any time. The other engraving is a shop view before assembling, showing the plunger at the left, the discharge section in the center, and the cylinder and dome at the right. The dome is supported by a set of separator bolts, one end of these being fastened to the dome in the smaller holes shown and the other to a cast steel supporting ring which fits around the outside of the valve body.



One of Two Very Large Hydraulic Valves That Have Recently Been Built—Before the Body Was Attached

The valve opening is 12 ft. in diameter. The over-all length of the valve from the tip of the plunger to the tip of the dome when the valve is closed is 23 ft. 4 in., the travel of the valve is 46½ in., and the largest diameter, which is in the discharge section, is 15 ft. 4 in. The total weight of each valve is 90 tons, the largest part, the discharge section, weighing 15 tons. The supporting cast steel ring for the valve body is 1 in. thick and 16 ft. in diameter. The valve is buried in concrete up to 30 in. from the center line, in the position as shown in the photograph, and the rear portion of the cast steel supporting ring is anchored into a concrete wall about 4½ ft. thick. A short piece of riveted steel pipe connects each valve with the turbine casing.

The valves are of cast iron except the body and supporting ring. Although the castings are large usual foundry practices were followed in making them, ordinary sweep and core methods being followed in the molding room. The discharge section casting ranges from 2 to 2½ in. in thickness, the cylinder is 2 in. thick and the dome from 1¼ to 1½



The Valve Parts: the Plunger at the Left, the Discharge Section in the Center and the Cylinder and Dome at the Right, Prior to Being Assembled

, thick. Bosses are provided on the outside of e cylinder to which the dome and discharge sec- ons are bolted, and the dome tip is bolted to the ome. The machining operations, including the oring of the cylinder to fit the plunger and the oring of the discharge section, were done on a ver- cal boring mill with a 22-ft. table built by the ompany.

The valves are bronze mounted. The operating linder is lined with bronze and the plunger is ced with bronze to prevent the possibility of stick- g due to corrosion. The plunger is ground to a atertight seat, and tests made in the field on the rst valve, which has been installed, show that not- ithstanding its unusual size it is absolutely water- ght. During tests it was found that it took 450 c. to close the valve with a ⅛-in. port opening nd 230 sec. with a ¼-in. opening. It was opened 180 sec. with a ¼-in. port opening and in 170 c. with a ⅜-in. port opening.

The valves are equipped for both hand and elec- ical control. The equipment for electrical control located on the main switchboard in the power ouse. It is exceedingly simple, a single movement f the control switch being sufficient either to open close the valve. The movement of the valve lunger is shown both by an indicator on the valve ody and also by an electrical indicator on the witchboard. Valves of the same type were built the Wellman-Seaver-Morgan Company for the ntario Power Company, Niagara Falls, Ont., and e Salmon River Power Company, Altman, N. Y.

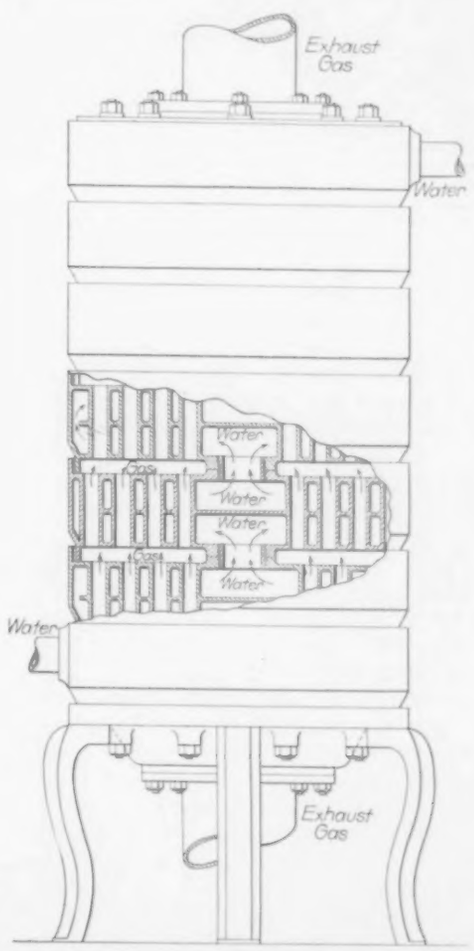
Owing to the size of the valves and the place of eir installation, considerable difficulty was experi- nced in getting the parts to their destination as ey had to be hauled 22 miles over narrow moun- in roads. Forty-eight horses were hitched to the uck that hauled the plunger, the most difficult ection to transport.

Heater Utilizing Gas Engine Exhaust

For utilizing the heat in waste gases from in- ernal combustion engines, as well as that lost hrough the cylinder walls into the water jacket, the ims Company, Erie, Pa., has brought out a heater nown as the Sims gas engine economizer. This eater is constructed entirely of cast iron in round ections that are built up in number and size ac- ording to the horsepower of the engine to which it connected. The sections are faced to give a metal- o-metal joint and are connected by screw-threaded leeves, the construction assuring a uniform con- raction and expansion. Each section is provided ith a flange or circumferential groove forming a eystone shaped orifice which is calked with suitable acking material. Passages for the exhaust gases re provided in each section of sufficient area to void back pressure on the engine. When the heater onsists of two or more sections, these passages are taggered from section to section so that the hot ases are brought in contact with the greatest mount of heating surface. The water spaces com- letely surround the walls of the gas passages.

The heater can be used for producing low- ressure steam, 20 lb. being the maximum, that can e utilized for heating buildings or for industrial ervice when a limited amount of low-pressure steam s required. It also can be used for providing a omestic hot water supply. The system can be ar- anged so that the heat from either the cylinder acket or the waste gases from the exhaust, or both ogether, can be utilized. It is stated that heat from he exhaust alone will convert 2½ to 3 lb. of water into steam at 5-lb. pressure per horsepower-hour. To generate steam the system includes a closed stor- age tank with a centrifugal circulating pump and a safety valve set at the desired pressure. It is claimed that should there be no use for the heated water or steam, the installation of the heater would be along the line of economy by reducing the gas consumption because of the better engine working conditions resulting from recirculating the jacket water at a uniform high temperature.

The inlet from the exhaust to the heater may be at the bottom and the outlet to the atmosphere at the top, or the reverse. When conditions require it, a horizontal installation may be provided. Various combinations can be worked out by the arrangement of water connections on different sections of the heater, such as heating water at different temperatures and making steam and hot water at the same time. In a typical installation designed for furnishing hot water heat for a building, the jacket water passes from the top of the engine to the bottom of the heater, from the top of the heater to the heating system and then back to the engine. An automatic temperature regulator should be part of such an installation to guard against excessive temperature when the demand on the system is light.

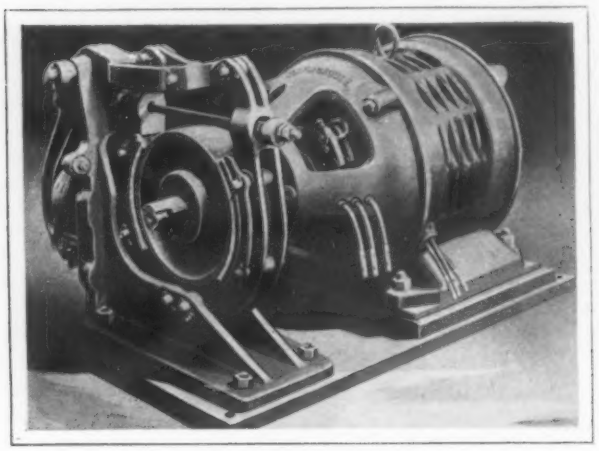


A Heater Utilizing the Heat in the Waste Gases of an Internal Combustion Engine as Well as That Radiated through the Cylinder Walls into the Water Jacket

A table prepared by the company indicates that a 10-hp. gas engine will heat from both exhaust and jacket in one hour, 873 lb. of water to 150 deg. Fahr. and 545 lb. of water to 210 deg. From the exhaust alone 365 lb. of water will be heated to 150 deg. and 220 lb. to 210 deg. A heater for a 10-hp. engine is 12 in. in diameter, 18¾ in. high and is composed of three sections.

Alternating-Current Magnetic Brake

A new alternating-current magnetic brake has just been put on the market by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. It has been designed especially for use with induc-



An Alternating-Current Magnetic Brake That Is Designed for Use on Induction Motors on Cranes and Various Classes of Rolling-Mill Machinery

tion motors operating cranes, hoists, roller lift bridges and many different classes of mill machinery, and it is applicable wherever frequent stops and reversals are necessary. The operating magnet is single-phase and can be used on polyphase circuits. The action of the brake is simple. When the controller is thrown to the off position two brakeshoes are forced by springs against a cast-iron brake wheel which is keyed to the motor shaft. When the motor is started the magnet coil is energized and the action of the magnet, operating through a lever and a toggle, forces the shoes apart and releases the brake.

In the design of this brake several improvements are embodied. It is a complete self-contained unit that can be mounted directly beside the motor or on a special sole plate. Since the application of its braking action is not dependent upon gravity, it can be mounted in any position, from the horizontal to 90 deg., in such a direction that the movable magnet lever has no tendency to fall away from the stationary magnet cover. This makes it especially desirable for applications where the position of the motor changes during the operation, as on a roller lift bridge. The over-all height has been reduced to a minimum so that it can be used in places where headroom is limited, as, for instance, in crane service. The insulation is such that the brake is adaptable for use outdoors and exposure to the weather without any modification whatever. No dashpots are used, thus all possibility of trouble due to sticking is eliminated. The brakeshoes are made of cast iron to which are fastened woven asbestos fabric linings. The wheel is made of cast iron, and the coefficient of friction between the brake wheel and shoes is not materially affected by oil, grease or water.

The pressure on the brakeshoes can be varied by nuts on the spring rods, and wear on the shoes can be taken up by an adjusting screw. Two springs are used and only two adjustment points are necessary. If the operator fails to take care of the adjustment which compensates for wear on the shoes the result will not be a failure of the brake to set. It will only mean that the machine cannot be started, as the brake will not release.

With a view to facilitating repairs, axle steel pins held in place by cotter pins have been used wherever possible. A pair of pliers and a screwdriver are the only tools necessary to completely dismantle or assemble the brake.

This brake, which is known as type A, is made in sizes ranging from 5 to 100 hp. for 25 and 60 cycle, 220, 440 and 550 volt circuits.

Some Handy Gasoline Engine Formulas

BY W. F. SCHAPHORST

Here are some formulas that I have found handy for the determining of the brake horsepower, indicated horsepower, and friction horsepower of gasoline engines of the hit and miss type.

Friction horsepower = $0.00000152\ ADN^2n \div t$.

Mechanical efficiency = $(N_i - N_n) \div N_i$.

Indicated horsepower = friction horsepower ÷ (1 — mechanical efficiency).

Brake horsepower = indicated horsepower — friction horsepower.

A = cross-sectional area of flywheel rim in square inches (see sketch herewith).
D = distance in feet, center of gravity to center of gravity of sections measured through the center of the shaft. The center of gravity of a section of this kind is most easily found by cutting out a piece of stiff card board shaped exactly like the section and balancing on a knife edge in several positions. This is an old, well known method.
N = number of revolutions per minute of the flywheel.
n = number of flywheels, exactly alike. Sometimes engines of this type have two and sometimes only one flywheel.
t = time in seconds required for the engine to come to a standstill after closing the needle-valve.
N_i = the number of explosions in the engine cylinder while operating at full load and normal speed.
N_n = the number of explosions in the engine cylinder while operating at no load and normal speed.

These formulas furnish a brakeless method for testing engines of the hit and miss type. No Prony brake is needed, nor is an indicator needed, although the method will by no means supplant the indicator. The indicator is still the best means for determining the interior condition of the cylinder as regards compression, ignition, exhaust, etc.

I developed the formulas rationally, basing them upon the first fact that the friction horsepower of an engine is constant regardless of load, as was first pointed out by Robert Thurston, and upon the second fact (closely related to the first) that when an engine comes to a dead stop, after closing the needlevalve, the deceleration is constant. In other words, the deceleration is similar to that of a body projected vertically upward.

For example, take an engine in which

$A = 16$ sq. in. $\quad D = 4$ ft.
$t = 60$ sec. $\quad Ni = 105$.
$n = 2$. $\quad Nn = 16$.
$N = 240$.

Inserting in the formulas I find the friction horsepower is 3; the mechanical efficiency = $(105 - 16) \div 105 = 85$ per cent; indicated horsepower = $3 \div (1 - 0.85) = 20$; and brake horsepower = $20 - 3 = 17$.

In actual tests, in which I have compared this method with the indicator and Prony brake methods, the errors (or differences) were so slight as to be almost negligible.

The United Furnace Company, which will erect a new blast furnace at Canton, Ohio, has elected the following officers: President, H. G. Dalton of Pickands Mather & Co., Cleveland; first vice-president, Harry Ross Jones; second vice-president, Ed Langenbach; treasurer, E. P. Williams, Cleveland; secretary, E. L. Hang. These officers, with Harry Pickands, of Cleveland, form the board of directors.

Using a Blank to Prevent Demurrage

What One Company Does to Effect Rapid Handling of Railroad Cars Without Incurring Costs Disproportionate to Savings

BY H. A. RUSSELL

Cars should be loaded or unloaded promptly for several reasons. It does not pay to switch them around from day to day. Furthermore, it is better to pay the loaders or unloaders than to pay demurrage for which you get no return. The foreman in charge of this branch of the factory or mill should have some means of knowing just how much time he has on each car. Since the daily average demurrage agreement went into effect some years ago, we have kept track of every incoming or outgoing car, and the time required is not over five minutes a day, and some months we will handle considerably over a hundred cars.

By using the form illustrated we know each day our credits are sufficient to offset the debits or we are taking too long to handle the various cars. Every morning the foreman's attention is called to the cars that have exceeded the 48-hr. limit of free time. When the agreement first went into effect, it was necessary to keep box cars separate from all other kinds, as the credit for the unloading of a box car within the 24-hr. period could not apply on any of the other kinds of cars. Now, however, there is no distinction. Our first supply of forms has not been as yet exhausted, consequently the illustration shows a separate column for box cars.

By keeping the foreman properly posted the saving at the end of each month is many times the cost of keeping the record accurately. Probably every firm, which handles any quantity of cars daily, is familiar with the system of credits and debits, so we will not repeat it here, but a little study of the illustration will show clearly the practicability of keeping the record. It is easy to locate the trouble if the debits are larger than the credits because we have divided the cars into two distinct groups, those to be loaded and those to be unloaded. Many times we use up all the free time on the unloading of a car, but will make a credit of one point on the loading. Under the date of July 12, car 27,317, we notice a debit of four points. This car was loaded with lumber which was not up to the specifications, and as several days elapsed before the mill representative came to adjust the matter the debits accumulated. In an instance of this kind our usual method is to charge this amount to the shipper providing that our debits are in excess of the credits at the end of the month.

DAILY AVERAGE DEMURRAGE CAR RECORD

July 9/15

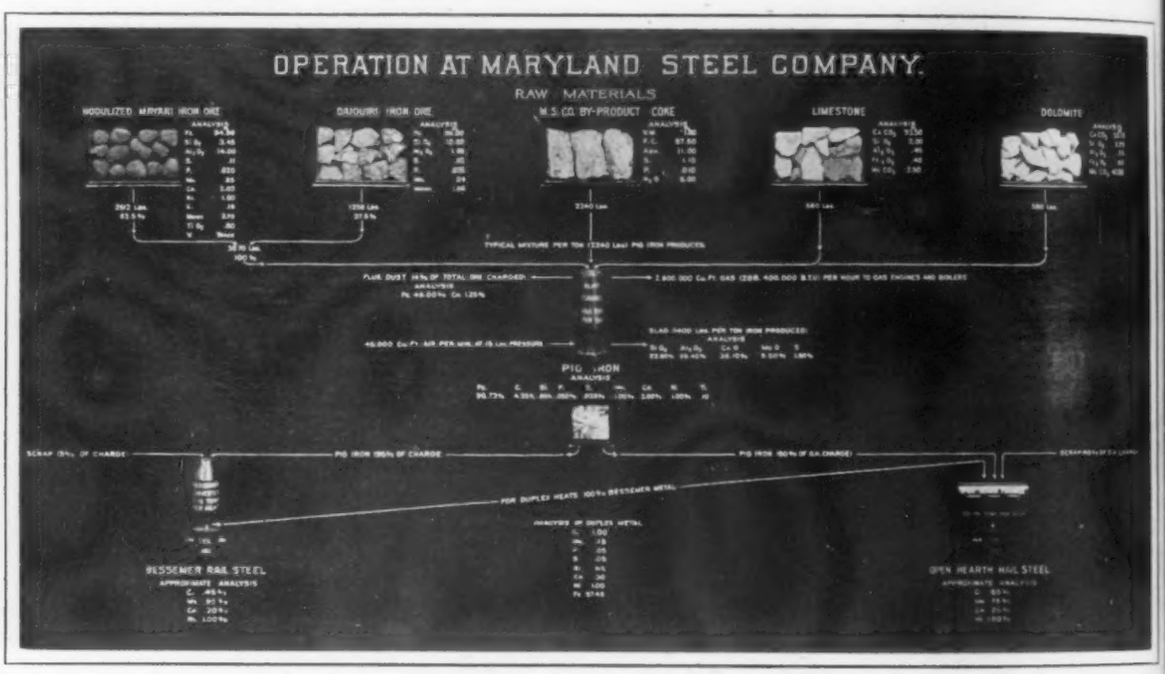
Initial	Number	Date Rec'd	Hour a. m.	Hour p. m.	Date Unloaded	Hour a. m.	Hour p. m.	Box Cars Credit	Box Cars Debit	All Others Credit	All Others Debit	✓	Initial	Number	Date Loaded	Hour a. m.	Hour p. m.	Box Cars Credit	Box Cars Debit	All Others Credit	All Others Debit	✓
P.L.	500204	7/4	7		7/5		4					✓										
P.L.	53973	7/5	7		7/5		2				1	✓										
Am.	63073	-	-										7/5		6				1		✓
P.C.	285444	7/6	-		7/7		5															
P.R.R.	285444	7/7	-										7/9	11					1		✓
P.R.R.	36084	7/7	-		7/9		5															
P.L.	50446	7/9	-		7/9	11													1		✓
P.R.R.	31286	7/9	-										7/20	10							✓
-	12261	7/20	-										7/22		4					1	✓
P.L.	26099	7/20		2									7/20		6				1		✓
P.R.R.	45549	7/21	7		7/21		5															
-	-	7/22	7										7/22		3				1		✓
P.C.	925401	7/22	7		7/24		1															
Am.	28499	7/23	-										7/24	10							✓
P.L.	231772	7/23	-		7/24		5															
P.R.R.	231779	7/24	-										7/24		6				1		✓
Am.	121924	7/26	-										7/26		3						✓
P.R.R.	20997	7/24		3	7/26	11													1		✓
-	35498	7/26	7										7/26		5				1		✓
P.C.	925431	7/26	-										7/29							2	✓
P.R.R.	35471	7/27	-		7/27		4												1		✓
P.C.	925436	7/28	-										7/30		5					1	✓
P.R.R.	31945	7/30	-										7/31	11							✓
										9	15								30	23		

Reproduction of Blank Used for Keeping Track of Demurrage Charges

STEEL MAKING IN TABLET FORM

Wall Panel Attracting Attention at the Panama-Pacific Exposition

A pictorial method of telling steel-making operations through the use of a wall panel or tablet has been adopted by the Maryland Steel Company at the Panama-Pacific International Exposition. The scheme of appealing to the public is so clever that a photograph of the exhibit panel is here reproduced for the educational and suggestion value which it has. The panel, which is of wood hung at one end of the Maryland Steel exhibit space in the Palace of Transportation, excites attention particularly through the windows in the board containing samples of the ore, coke, limestone and the like, and through the miniatures of the blast furnace, converter, etc., shown. The board is calculated to show at a glance not only the products going into and coming out of the blast furnace, but the combinations for Bessemer steel, for open-hearth steel or for the more modern process of duplexing.



Reproduction of a Wall Tablet, Minus Its Molding Border, at the Panama-Pacific Exposition Exhibit of the Maryland Steel Company

As the letters and figures suffer by the photographic reproduction, the following explanation of what the tablet conveys may be made. It shows first the typical mixture per ton of 2240 lb. of pig iron produced: The burden of the furnace is made up of 2612 lb. of nodulized Mayari iron ore and 1258 lb. of Daiquiri iron ore, 2240 lb. of the Maryland Steel Company's by-product coke, 580 lb. of limestone and 580 lb. of dolomite. Into the furnace is delivered also 40,000 cu. ft. of air per min. at 15 lb. pressure. From the furnace for each gross ton of pig iron produced it is explained that flue dust amounting to 4 per cent of the total ore burden is discharged and that 2,800,000 cu. ft. of gas, having 288,400,000 B.t.u. calorific value, are obtained per hour available for use in gas engines and boilers, and in addition 1400 lb. of slag per ton of iron. The tablet gives analyses in percentages as shown in the accompanying table.

The bottom part of the tablet shows how the charge for the Bessemer converter is made up of 5 per cent scrap material and 95 per cent of pig iron and the charge for the open-hearth furnace is made up of 40 per cent scrap material and 60 per cent of the pig iron. The tablet also shows the approximate analysis of Bessemer rail steel obtained directly from the converter, the approximate analysis of rail steel obtained from the open-hearth furnace and the analysis of duplex metal when the product of the converter is passed through the open-hearth furnace, as indicated. The analyses given for the steels are as follows:

Bessemer rail steel; C 0.45; Mn 0.90; Cr 0.20; Ni 1.00.
Open-hearth rail steel: C 0.65; Mn 0.75; Cr 0.20; Ni 1.00.
Duplex metal; C 1.00; Mn 0.15; P 0.05; S 0.05; Si nil; Cr 0.30 Ni 1.00; Fe 97.45

Some of the general features of the combined exhibit of the Maryland Steel Company and the Pennsylvania Steel Company were given in THE IRON AGE of July 15. As supplementary, mention may be made of some exhibits of rail tests. The exhibit shows, for example, a Baltimore & Ohio 120 lb. open-hearth rail which was subjected to a drop test on supports 3 ft. apart with a ball weight of 2000 lb. and a fall of 18 ft. A permanent set of 0.65 in. was recorded. In the case of a Pennsylvania 100-lb. open-hearth rail, also shown, a permanent set of 1.10 in. is reported. The results of some tests on rail joints are also shown. In the case of a joint using Mayari steel bolts, it is noted that after 45 drops and 5.60 in. deflection, the bolts are still intact. In the case of a rail joint employing ordinary steel bolts it is noted that 24 drops produced 5.55 in. deflection and three of the bolts are broken. In the case of iron bolts three bolts are broken after four drops with a deflection of 1.30 in.

Analyses of Raw Materials and Output

The nodulized Mayari iron ore: Fe., 54.98; Si O_2 3.45; Al_2O_3 14.00; S 0.11; P 0.020; Mn 0.85; Cr 2.03; Ni 1.00; C 0.19; moisture 2.70; Ti O_2 0.60; V, trace.

Daiquiri iron ore: Fe 58.00; Si O_2 10.69; Al_2O_3 1.08; 0.52; P 0.025; Mn 0.24; moisture 1.56.

Coke: Volatile matter 1.00; fixed carbon 87.50; ash 11.00; S 1.10; P 0.010; H_2O 6.00.

Limestone: Ca CO_3 93.50; Si O_2 2.00; Al_2O_3 0.45; Fe_2O_3 0.40; Mg CO_3 2.50.

Dolomite: Ca CO_3 53.13; Si O_2 2.25; Al_2O_3 0.55; Fe_2O_3 0.60; Mg CO_3 42.00.

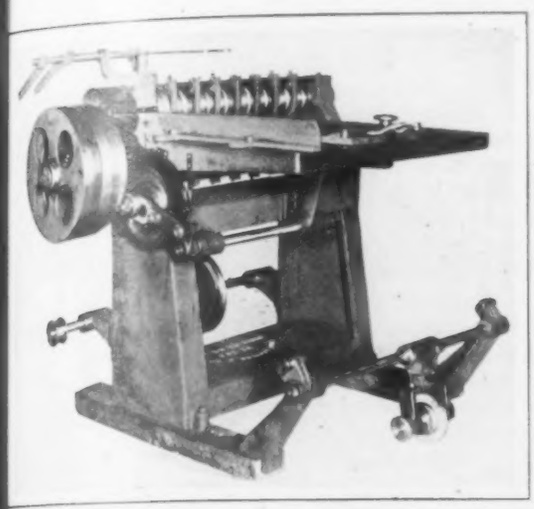
Flue dust: Fe 49.00; Cr 1.25.

Slag: Si O_2 22.50; Al_2O_3 29.40; Ca O 36.10; Mg O 9.50; S 1.90.

Pig iron: Fe 90.73; C 4.25; Si 0.85; P 0.050; S 0.025; Mn 1.00; Cr 2.00; Ni 1.00; Ti 0.10

Gang Slitting Machine for Metal Sheets

For slitting metal sheets into strips having arallel edges, Charles Leffler & Co., 61 Clymer treet, Brooklyn, N. Y., have brought out a heavy ty gang slitting machine. This machine is a de-



Gang Slitting Machine for Metal Sheets Equipped with Automatic Feed and Grinding Attachment

elopment of the earlier ones built by this firm. If esired, it can be furnished with automatic power eed and a grinding attachment for sharpening the utters.

Double-edged tool steel cutters 6¼ in. in diamter and ½ in. wide are used. They are sharpened nly on the side, and it is pointed out that in this ay the relative speed of the cutters and feed rolls s not changed and adjustment between the shafts s also eliminated. The cutters and their hubs are nterchangeable, and the latter are mounted on the hafts so as to prevent displacement. The standard idth of hubs and cutters is 3⅛ in. and strips arrow as 3½ in. can be cut by the machine. If arrower strips down to a minimum width of 2 in. re desired, a special type of narrow hubs and cuters measuring 1⅝ in. in width can be provided. The shortest length handled by the machine is 3¾ n. and the maximum width of sheet handled is 30 n. The shafts on which the cutters are mounted re of heavy construction with end thrust bearings. This arrangement is relied upon to prevent lateral motion and secure accurate adjustment, while the arge diameter of the shaft prevents it from springng. If desired, the shaft can be removed from the machine without taking out the cutters, and when he bearings eventually show wear it is possible to eplace the long bushings easily.

The machine as usually built is furnished with a and feed, although if desired an automatic power eed can be supplied. This will feed the material niformly and is designed so that it has a quick eturn and a slight dwell at the end of the backward stroke. Ample time, it is emphasized, is given he operator for placing the sheet before it is fed to he cutters. The grinding attachment is driven rom the machine itself. It is of simple construction and easily attached.

The machine weighs 1250 lb., and occupies a floor pace of 38 x 55 in. The height of the table from he floor is 35 in.

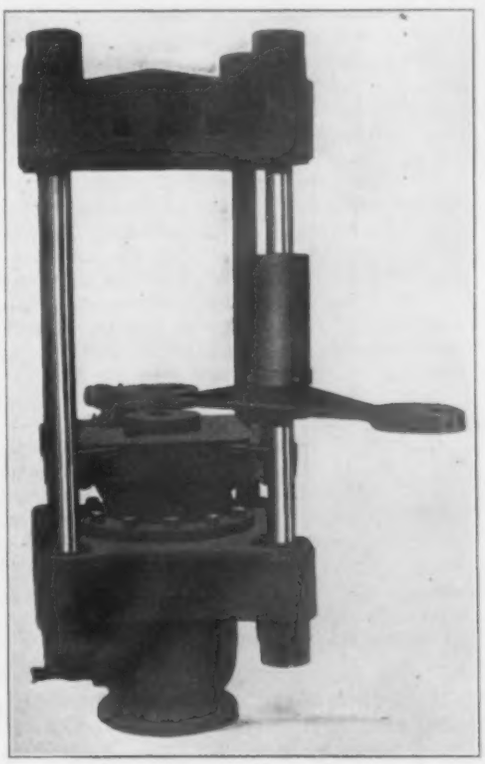
The total number of foreign-built vessels admitted o American registry to July 31, 1915, was 150 of 528,408 gross tons.

Shell Nosing and Banding Presses

For finishing steel shells after they have been forged and drawn into shape, the Hydraulic Press Mfg. Company, Mount Gilead, Ohio, is building a number of hydraulic presses. These perform the last two operations done on the rough blank preparatory to the machine work, which are the nosing of the shell and pressing or shrinking the copper band in place.

For the first of these operations an upward pressure press of the type illustrated is used. The end of the shell after it has been formed from the solid steel billet and drawn into shape is heated and set in a centering die on the platen of the press. A die having a conical shape to correspond to the nose of the finished shell is attached to the head of the press and the shell is forced into it and the edges turned in. A two-arm revolving loading attachment having a capacity for receiving two shells, one on each end, works on one of the strain rods. In this way it is possible for the operator to have a shell ready at all times to undergo the nosing operation when the one in the press is finished. The nosing press can exert a maximum pressure of 150 tons and steel is used throughout in its construction. Either an independent pump or an accumulator system is employed in its operation.

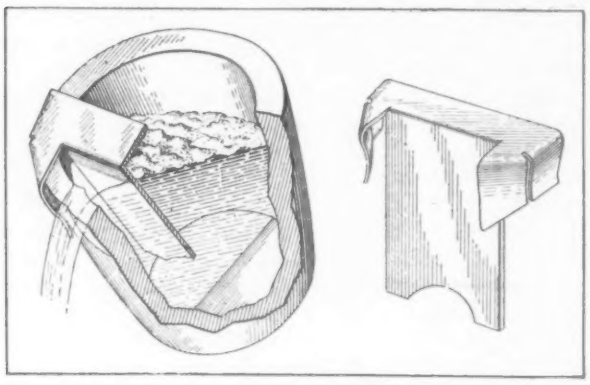
After the shell has been pointed the next operation is that of shrinking the copper band around the base of the shell, which is done in a four-cylinder horizontal press. The rams from the four cylinders bear on the band simultaneously at four equidistant points. The pressure required for this work ranges from 20 to 75 tons, and the press is operated from an independent pump or from an accumulator system. While the pressing operation is being performed, the shell is supported in the center of the press by an adjustable table or stand from underneath the heads of the rams. With a view to securing the band at all points where it makes contact with the shell the latter is turned two or three times.



A 150-Ton Hydraulic Forming Press Equipped with a Revolving Die Holder for Nosing Steel Shells

Device for Pouring Clean Metal from Crucibles

In certain lines of foundry metallurgy, such as crucible steel or brass foundries, it is highly desirable, after metal has been melted in a ladle or crucible, to pour it therefrom so that the metal will issue as clear and as pure as possible. If it can be



Device for Pouring Clean Metal from Crucibles

freed of all surface impurities such as dross, flux, charcoal, etc., better castings are likely to result. With this object in view a patent (U. S. 1,146,573, July 13, 1915) has been granted to Charles F. Jacobs of Chicago, Ill., covering an implement, shown in the illustration, which can be placed in crucibles before pouring. The device provides a means for draining the metal from the bottom of the crucible and for causing the scum or slag to separate and float on top as well as to be retained in the crucible.

Westinghouse Relief Department Regulations

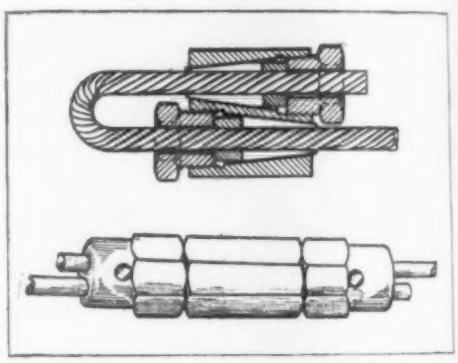
The regulations of the Westinghouse Electric & Mfg. Company's Relief Department have been printed in pamphlet form. They cover the sickness and accident relief and accident compensation provided for employees. The relief department is a regularly organized department of the company in charge of a superintendent, reporting directly to the president. The company has general charge of the department and has the custody of all the moneys and assets belonging to the relief and accident compensation funds. The first of these consists of contributions from members, income derived from investments and interest paid by the company and appropriations made by the company, while the latter consists of contributions made solely by the company, the income derived from investments and interest paid by the company. These funds are held in trust by the company for employees and their dependants or other beneficiaries to whom compensation shall be awarded against such funds. The membership is divided into six classes, according to the rates of monthly pay and the contributions range from 25c. per month for those earning less than $30 per month up to $1.50 for those whose wages are $95 or more per month. The weekly disability benefits range from $2.75 to $16.50 and the death benefits from $50 to $150. The company in cases where death occurs from accident due to causes other than accident occurring while at work as an employee contributes an amount equal to that paid by the relief department. Membership in the department is not compulsory, but in taking on or laying off help preference is given to such members and they alone are eligible for service pensions.

The U. S. Reduction Company, East Chicago, Ind., producer of aluminum metal and alloys and babbitt metal and solder, has enlarged its plant by the completion of two buildings, one for receiving purposes and the other, a two-story structure, for use as a laboratory equipped with modern electric devices.

New Grips for Cables and Wires

Two interesting devices for gripping and connecting cables and wires are shown in the accompanying illustrations. They show two types made in a considerable range of sizes and in various modifications by the Fargo Mfg. Company, Inc., Poughkeepsie, N. Y. One of these is for steel cable, as for example, in elevator work or in tension lines of various descriptions. It is composed of a sleeve with a conical surface inside and a cone fitting over the cable and slit so that as it is pushed against the conical surface of the sleeve the segments of the cone formed by the slitting can be pressed against the cable which it is to grip. It employs the principle of the wedge, or, perhaps better, the principle used in some expansion bolts. The more the inner conical member is forced into the sleeve, the tighter is the pressure on the cable. A nut is used to drive in the cone, as indicated, and the tighter the pull on the cable the tighter does the inside cone press against the cable.

The second cut shows one form of a device for connecting two wires, and this as well as the cable grip may be made of steel or brass, according to the circumstances of use, as for electrical wires or steel tension wires, etc. In the case of the straight connection for joining two wires, it is to be noted that there are two holes extending through the device. Through one is put the end of one wire and through the other the end of the second wire. Each of the



A Wire Gripping and a Wire Splicing Device

nuts shown toward the end of the device is then screwed toward the central member, and in so doing the wires are twisted about each other, so that not only is it impossible to untwist the wires by direct pull but a close contact is made between the wires through the device itself, a fact of importance when the connection piece is used in an electrical line.

A New Light Kissel Delivery Car

The new Kissel 1000-lb. delivery car is attracting attention in the trade for the reason that it is one of the few light commercial vehicles to come from a factory hitherto specializing in heavier trucks. The Kissel Motor Car Company, Hartford, Wis., has built trucks for eight years, nearly as long as it has been identified with the manufacture of pleasure cars, but never before has it offered a model of less than 1500-lb. capacity. The 1000-lb. delivery car is of the same construction as the larger KisselKar trucks, making it an unusually sturdy vehicle for its weight. Another feature among the seven new models of the company's trucks is the substitution of worm drive for chain drive in the 1, 1½ and 2-ton sizes.

The Steel Company of Canada, Hamilton, Ont., has made arrangements to increase its open-hearth steel capacity to take care of the large orders it has received from England and from the Canadian Car & Foundry Company.

THE EXECUTIVE'S PROBLEM*

An Analysis of What is Involved in Different Forms of Management

Three types of executive action are the typical ones in operation in America to-day.

1.—RESPONSIBILITIES ON SUBORDINATES

In the most common type, the executive is thoroughly acquainted with his business as far as general matters are concerned. He has an appreciation of the capacity of his equipment and of the quantity and time of disposition of his product. He has confidence in the ability of his subordinates to carry out his broad views both in production and in selling. This type of action can be reduced to the following form:

The executive sets a general task without conference with subordinates.

The accounting for accomplishment to task comes only at the time of maturity of the task.

Except in rare instances, due to lack of consultation with subordinates, the executive finds that the accomplishment does not agree with the task at the time of maturity. The occasional approach to it is accounted for by virtue of the subordinates' frequently calling upon the executive for translations of the original task as well as for changes of the original task. The real responsibility rests upon the subordinates.

2.—EXECUTIVE TAKING THE GUIDING HAND

In the next most common type, the executive holds conferences with subordinates, securing opinions in a more or less systematic manner. He then issues his general tasks for the subordinates to carry out according to the conference. The executive calls for reasonably frequent conferences at which opinions are again expressed and any changes which are necessitated by each conference are provided for through a change of the general tasks by the executive. Results are accounted for chiefly by the subordinates guided by the opinion of the executive.

3.—EXECUTIVE PLANS SPECIFIC PROCEDURE

In the third type the executive holds a preliminary conference with his subordinates discussing at that time fundamental elemental data. In this conference the quantity and rate of output is determined. The executive then plans not only the general procedure but the specific procedure of each subordinate in the organization. Ways and means are provided to carry out the standardized instructions of the executive.

General tasks and all detailed tasks are set to the least element of the business and accomplishments are perpetually checked against the task. Standard methods are developed to maintain the accomplishment continuously to the task. Each subordinate is responsible for his task only. This may be a simple task or a task requiring effort of co-ordination of simple tasks. The executive supervises the accomplishment toward the task of the larger groups only. The head of each group in turn supervises the accomplishment toward the task of sub groups or of individuals.

Results are accounted for by the individuals to the heads of each group; from the heads of the groups to the executive and finally by the executive. This is done not, however, by the time-killing methods of conferences, but rather by physical or graphical expressions of the accomplishments toward the task.

THE THREE TYPES IN THE ONE BUSINESS

One or all of the above-mentioned three types of executive action may be maintained in the same industry, and in the later managerial practice this is not uncommon. For example: A general manager maintains the prestige of the company, financing it and indicating the general character and quantity of product that he desires. He transmits his instructions by direct orders to the heads of general departments, such as a general superintendent or works manager who might then act in the capacity of the second form No. 2; that is, hold conferences with his divisions through frequent meetings to keep in touch and direct their general efforts. The heads of each of the divisions might act under the No. 3 type of management.

Recent experiences have brought out the desirability of the position of No. 3 being as high in the series; that is, as near to the chief control of the business, as is possible. The same recent experiences have indicated that it is of great economic importance that No. 3 should appear somewhere in that series.

The elemental data under the No. 3 type of management will consist of the following units, by elemental data being meant the detailed information about the least subdivision of the subject.

a—A record of the elements which occurred in past effort upon similar product.

b—Elemental records of other product which contains the same elements.

c—Elemental records of other executive performance upon similar product or of other product composed of the same elements.

d—Elemental information from outside sources of aids to the carrying out of the problem, but which aids have not up to that time been in current use or practice.

e—Elemental information as gathered from society, association and private research.

f—Estimated probable inventive ability of subordinates.

DEFINITION OF SCIENTIFIC MANAGEMENT

Type No. 3 management illustrates what has been called scientific management. "It is that kind of management which conducts a business or affairs by standards established by facts or truths gained through systematic observation, experiment or reasoning."

Once a decision has been reached it should not be changed in the least detail, but should be maintained for a sufficient time to obtain a record of the elemental performance under that decision, thus providing a record of performance as a guide in future decisions. The change of decisions which have once been made is seldom due to a change of causes, but such changes are usually due to incomplete or inaccurate data or an incorrect synthesis of accurate elemental data. This latter fault is unfortunately common, owing to the assumption on the part of the executive that troubles which arise may be cared for some way through the ingenuity of the organization.

Another serious weakness in the application of the executive action is the changing of decision due to the fault of not carrying out the original decision as planned. The chief cause of failure in the decision's not being carried out is the attempt to try to meet the task in large units and not by meeting the task with the elements. Executive tasks should be simple but reaching to the extreme element affected by the decision. They should provide complete, exact instructions for ways and means to accomplish the task as well as for the task itself. Above all they should be exact. On the basis of this the executive should assume full responsibilty for all of such detailed instructions as well as for the final accomplishments which he must expect as his burden.

Co-ordination of a complex organization is one of the fundamentals of successful management. Co-ordination of effort on a complex work is even more difficult but correspondingly successful in practice.

*From an address made before the Employers' Association of Auburn, N. Y., by George D. Babcock, production manager, H. H. Franklin Mfg. Company, Syracuse, N. Y.

The Submarine Boat Corporation, recently incorporated, has elected the following vice-presidents: E. B. Frost, L. Y. Spear, Henry R. Sutphen and Gregory C. Davison. Stacey C. Richmond of Winslow, Lanier & Co., 59 Cedar Street, New York, has been made temporary treasurer. These officers, with Norman Johnson, general counsel of the company, and Thomas C. Dawson, H. C. Sheridan, George W. Hoyt, William H. Remick and Andrew Fletcher, complete the board of directors.

Through the Harvey Company, 113 South Street, Baltimore, Md., an effort is being made to secure a large war contract for portable furnaces. If the contract is secured it is said it will be filled by the Monarch Engineering & Mfg. Company, Curtis Bay, Md.

Non-Ferrous Metals and the War

European Consumption and the Advances in Copper, Zinc and Lead — Highest Grade Spelter and Munitions Work

At the June meeting of the New York section of the Mining and Metallurgical Society of America, various economic features of the war in Europe were discussed. W. R. Ingalls, president of the society, spoke of the effect of the war on the metal market especially as brought home to this country in the last few months. He said in part:

"It is hard for us to see just why the armies and navies are requiring so much of the metals. It is probable that the large purchases recently made were to a considerable extent anticipatory, covering expected requirements as far ahead as next spring, in some cases, rather than being a measure of current consumption. Nevertheless, there is no doubt whatever that the armies and navies are using an extraordinary quantity of metals.

"When the war began there were some sanguine persons who talked about the large demand for copper that the war was going to create, but they were hooted at by all of the experts, who said that the military consumption of copper could not, by any possibility, replace the loss of peaceful consumption. In this case the experts were wrong and the inexperts were right, although they struck the bull's-eye blindly and by accident, inasmuch as at that time not even Lord Kitchener nor the French and Russian military authorities appreciated what they were going to need in the way of ammunition.

CONSUMPTION OF COPPER

"About the beginning of this year there was published in the London *Times* a carefully prepared estimate showing that the Allies were using copper on their line of battle at the rate of about 100,000 metric tons per annum. At about the same time a statement came from Berlin to the effect that the German use of copper was at the rate of about 100,000 metric tons per annum. These estimates were apparently independent. The only criticism I have ever heard of them is that both of them were too low. The fury of the artillery firing in recent battles also points that way, as do moreover the statements by the British authorities respecting the great quantity of ammunition that is required. Considering that the world's largest production in any year was about 1,000,000 metric tons, we begin to have a better perspective of the military demand.

"It is puzzling to the non-military man to understand how so much copper is being used. Of course we know that the French use a rifle bullet which is chiefly copper, this bullet weighing a little less than half an ounce, and the cartridge case is brass, which contains a large percentage of copper. The discharge of millions and millions of these cartridges gets away with a great deal of copper.

"A great deal of copper is required for the cartridge cases for fixed ammunition of the larger calibers. The small-arm cartridge shells are an absolute waste, just as are their bullets. The larger cases, however, may be sent back to the arsenals for reloading, which is something the Germans appear to be careful about, even if the Allies are not.

"Shrapnel has a brass firing head, which I judge from descriptions is much like the combination lock of an old-fashioned safe. These heads are machined from brass rods and are graduated to correspond with the time fuse to explode them. Shrapnel, as well as shells, have a copper girdle to engage with the rifling of the gun. Of course, copper is required for many other purposes, such as telephone wires, machinery parts, and a multitude of things of which probably few of us have any conception.

WAR PURCHASES OF HIGH-GRADE ZINC

"In the aggregate, then, the armies are using more copper than we ever dreamed they could. Most of it is used in the form of brass, which, of course, requires a corresponding proportion of spelter. In purchasing the spelter for this brass an extraordinary effect upon the market was produced. Ordinary brands of spelter rose to about 500 per cent of normal value, while high-grade spelter realized prices approaching the price of tin in ordinary times. Attention was chiefly centered on the special brands of spelter produced by the New Jersey Zinc Company. This is a metal in a class by itself, containing upward of 99.9 per cent zinc, and being free from undesirable impurities to an extent that is unmatched by any other spelter. This spelter is sold as the Bertha and Horsehead brands. Before the war such spelter had a rather limited use for special purposes. Inventors and promoters were always going to duplicate it, and in prospectuses they were always going to get the 2c. or 3c. premiums that these brands normally realized above the price for prime Western. Those of us who knew something of conditions warned all of our friends who wanted to go into such enterprises that the addition of any important supply of this kind of metal, even if it could be produced, would break the margin, and in figuring upon a new zinc-smelting enterprise it was never safe to reckon on anything higher than the price of prime Western or good ordinary brands.

"Recent events have been directly contrary to our *antebellum* opinion and advice. We have seen it impossible for buyers to obtain all of the high-grade spelter they wanted, whence the premium for such spelter rose phenomenally. Almost anything that the New Jersey Zinc Company wanted to ask it could get. Other smelters were left to make a spelter by redistillation, almost but not quite as good. Impure spelter may be refined into pure spelter by redistillation, just as pure water may be obtained from brine, but there is difficulty with respect to the cadmium content, which is volatile like zinc, and perhaps some difficulty with respect to lead also; wherefore it appears to have been impossible to raise the spelter redistilled from prime Western above 99.75 to 99.85 per cent of zinc, which makes it a high-class intermediate spelter, rather than high-grade spelter properly speaking, according to the official classification. However, such spelter has been greatly in demand and has commanded very high prices.

"Now, just why the military buying has been so insistent upon these superior brands is something of a mystery to me. Of course, I know that such spelter has always been required for the manufacture of cartridge cases, and there are good reasons why it should be, but apparently manufacturers who have been going to make ammunition of other kinds than cartridge cases have also insisted upon such spelter. I have wondered whether the military experts have not, in some cases, specified a purity that is not really necessary, having in mind only the idea of obtaining the very best. I have not heard that German military authorities have exhibited any such crazy demands for high-grade spelter. What have they been doing for their supply of it? Other things are curious. Why should it have been necessary to produce a condition of spelter selling for £110 ($535.31) per ton in London, while it is selling for £29 ($141.12) in Germany in 1000-ton lots?

"Lately we have witnessed, also, a spectacular demand for lead. This metal is used for the cartridge bullets, for the shrapnel balls, etc. Other metals have experienced similar advances, which non-military persons did not foresee. Antimony is one of them. This

used for hardening the lead for the several bullets. Quicksilver is used in making the fulminates which go into the caps. The quicksilver market has been especially disturbed since Italy entered the war and thus cut off the supplies that we were heretofore able to draw from it. Aluminum is used largely in the construction of aeroplanes and dirigibles. There are rarer metals which also have had sensational advances. Such a one is magnesium, which doubtless is required for making the illuminating bombs, flares, etc., used in night attacks."

REMARKS BY G. C. STONE

George C. Stone of the New Jersey Zinc Company contributed the following to the discussion:

"In ordinary times the brass used for making cartridges in this country requires about 4000 tons of spelter a year. At present a very much greater amount is being used. Probably no metal is treated more severely than cartridge brass, and it requires the best grade to stand the severe strains in the drawing presses. Iron hardens brass and makes it difficult to draw. Lead and cadmium not only harden it but make it brittle, causing a very heavy loss in scrap, due to cracking. Ordinarily the cartridge makers will use only a metal free from cadmium and containing not over 0.05 per cent lead and 0.15 per cent iron. At present the demand so far exceeds the possible supply that less pure material is used, at the cost of a much heavier loss in scrap. Cartridges made from impure material do not keep well but are apt to crack in storage, especially in hot climates.

"The present high prices are due partly to the large amount of brass required for military and naval purposes, and also to the changed conditions in Europe. The production of Germany, Austria and Belgium is about 150,000 tons in excess of the consumption, and that of all other countries, except the United States, about 150,000 tons less. In the United States production and consumption about balance. As we are now called upon to supply the 150,000 tons ordinarily furnished by Germany and Belgium, in addition to the extra amount called for by the war, it is not surprising that prices are abnormally high. The Germans were stocking high-grade zinc ore when I was in Germany twelve years ago."

Answering the question whether aluminum has been used for alloying with copper instead of zinc, i.e., attempting to use an aluminum bronze instead of brass, Mr. Stone said that it has for many purposes, but not for cartridges. It will not draw and there is no time to experiment now.

SUBSTITUTION OF ELECTROLYTIC FOR LAKE COPPER

Mr. Ingalls, referring to the use of electrolytic copper, said: "Just as high-grade spelter is required for cartridge brass, so is Lake copper ordinarily specified. Lately, however, some cartridge manufacturers, who in a history of more than a quarter of a century never used anything but Lake copper, have been trying some experiments with electrolytic copper. The cartridge manufacturer is not ordinarily much of an experimenter. In general, the replacement of Lake copper by electrolytic, which of course is a purer copper, has proceeded upward through the line of manufactures, beginning with the cruder forms. It has been necessary to overcome much ignorant prejudice on the part of the workmen. If a manufacturer is engaged in drawing wire or rolling sheet, wherein the labor cost is only one or two cents per pound, he can afford to take a chance. If the product is wrong, its scrap value is so high that no great loss is suffered. If, on the other hand, a manufacturer is making a product like cartridge cases, which before the war were worth 35c. or 36c. per pound, whereof about 15c. was for the raw material, let us say, and the remainder for other charges, chiefly labor, there was risk of a large loss if the product were wrong, the scrap value of bad cartridge cases being relatively low.

"The great strike in the Lake Superior copper region two years ago forced a good many copper manufacturers to go over to the use of electrolytic copper, who previously had remained unconverted. They could not, in many cases, obtain Lake copper, and therefore were obliged either to use electrolytic or shut up their works. Naturally, they tried electrolytic, and, in numerous cases, they found that it was better for their purposes than Lake copper."

E. G. Spilsbury, consulting engineer, New York, said: "The Germans have been doing the same thing with the rarer metals that they have done with zinc ores. They have been importing all of the monazite sand that could be gotten for the last two or three years and storing it. Another metal which has increased very much in price is tungsten. As a hardening metal in steel it is almost impossible to replace. The attempt has been made to replace it with molybdenum, with the result that molybdenum sulphide has now gone up to $1.75 per pound. Many other rare metals have similarly increased in value."

Iron-Ore Production in 1914

The quantity of crude iron ore mined in the United States in 1914 was 41,439,761 gross tons, as compared with 61,980,437 tons mined in 1913, a decrease of 20,540,676 tons, or 33.14 per cent, as reported by E. F. Burchard, of the United States Geological Survey. The quantity of iron ore shipped from the mines (marketed) in the United States in 1914 amounted to 39,714,280 tons, valued at $71,905,079, as compared with 59,643,098 tons, valued at $130,905,558, marketed in 1913. This represents a decrease in quantity of 19,928,818 tons, or 33.41 per cent, and in value of $59,000,479, or 45.07 per cent. The average price of ore per ton for the whole country in 1914 was $1.81, as compared with $2.19 in 1913.

These quantities of ore, both mined and marketed, include the iron ore used for fluxing other metallic ores at smelters in the Middle and Western States, but the marketed ore does not include the iron ore sold for the manufacture of paint. The quantity of iron ore marketed for paint manufacture in 1914 amounted to 18,452 tons, valued at $46,995. The ore reported as sold for fluxing purposes other than in the manufacture of pig iron amounted to 42,677 tons, valued at $114,985, in 1914, as compared with 62,842 tons, valued at $235,588, in 1913.

The domestic iron ore actually marketed for the manufacture of pig iron amounted in 1914 to 39,671,603 tons, valued at $71,790,094, as compared with 59,580,256 tons, valued at $130,669,970, in 1913.

The following table gives a comparison of the iron ore mined, by States, in 1913 and 1914:

State	1913 Gross tons	1914 Gross tons
Minnesota	38,658,793	21,946,901
Michigan	12,841,093	10,796,200
Alabama	5,215,740	4,838,959
Wisconsin	1,018,272	886,512
New York	1,459,628	785,377
Pennsylvania	489,056	496,326
Virginia	483,843	378,520
Wyoming	537,111	366,962
New Jersey	325,305	350,135
Tennessee	370,002	330,214
New Mexico	164,085	81,980
Georgia	155,236	67,722
North Carolina	69,235	57,667
Missouri	39,354	37,554
Kentucky	3,400	21,400
Utah	14,690	(a)
Colorado	(a)	10,464
Connecticut	(a)	2,149
Massachusetts	(a)	7,600
West Virginia	7,808	6,530
Maryland	(a)	6,369
Ohio	7,849	5,138
Montana	2,475	(a)
California	2,092	1,282
Other States (b)	115,370	40,800
	61,980,437	41,439,761

(a) Included in other States.
(b) In 1913: Colorado, Connecticut, Idaho, Maryland, Massachusetts, Mississippi, Nevada and Texas. In 1914: Idaho, Mississippi, Montana, Nevada and Utah.

Iron ore was mined in 27 States in 1914, as compared with 28 States in 1913, no commercial production having been reported from Texas in 1914. Of these States, 4—Idaho, Montana, Nevada and Utah—produced ores for flux only; part of Colorado's production was for fluxing and part for pig iron; the remaining States produced iron ore for blast-furnace use only, except small quantities for paint from Georgia, Michigan, New York, Pennsylvania and Wisconsin.

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Increasing Munitions Production

Are the requirements in material and workmanship in the manufacture of war materials too exacting? Such seems to be the burden of complaints aired in England and occasionally heard in this country. When munitions are made against an indefinite need of the future and time is not an element, closest possible compliance with specifications is attempted without objection. When the munitions are not for indefinite storage, but are to go into early use and when, as now, the demands are of an emergency nature and for the maximum quantities that it is possible to get, it is felt that some of the refinements are unnecessary.

The suspicion is that field repairs for one thing are not likely to be made with fine tools, that rough files are likely to be too handy. If, as is claimed, projectiles are used in guns of a slightly larger bore than intended, some of the manufacturing requirements would seem to go for naught. If a steel is sufficiently strong to resist distortion on the explosion which forces it from the gun barrel, so it cannot ruin the barrel rifling, it should not matter exactly how it was rolled. There ought to be no splitting of hairs if speed of production following a method not receiving the approval of the inspector gives a steel which will meet the real demand. In England it is claimed that some of the rather close limits demanded in machining make it difficult to utilize machines which more lenient specifications would allow. There the cry is for some modification in the design or specifications so that special machines will not be needed, but instead that high production may be obtained with existing equipment and at the hands of labor of relatively little skill. For some weeks also requests have been made in England for a consideration of cast iron for shells, predicated in part on the reported discovery of cast iron shells coming from the Teuton lines. The foundries are not so busy that they could not augment the supply of shell cases, and as emergency projectiles for some occasions the British war office has been importuned to consider cast iron.

General comment in this country after all bears mainly on the disregard of the numerous small machine shops as possible participants in the war business. Inland as well as seaboard shops are generally unable as yet to interest the contract dispensers. The present tendency is to subdivide a contract as little as possible, placing large bulk business with large producers. There is undoubtedly a limit to the number of interests which can profitably handle a given contract and each successive holder of a part of a contract cannot afford to take the chances and the burdens of too widely distributing the work, but with idle machines in the small shops against unbuilt machines required for the large shops, the small shops ought soon to get a share, considering the pressing needs of the buyers. There seems little likelihood that war munitions will undergo a change in design, or that manufacturing requirements or the ideas of inspectors will be modified, so that immediate increased output here could undoubtedly be best assured by engaging the small shops.

The Steel Statistics

The official statistics of the production of steel in 1914, published in THE IRON AGE of last week, show substantially the same decrease from 1913 to 1914 as was known at the beginning of the year to have occurred in pig iron. In practically all iron and steel products 1913 had been the record year. In pig iron, steel ingots and rolled steel the decrease in 1914 was about 25 per cent. In rolled iron the decrease was 30 per cent, while in steel castings it was no less than 32 per cent.

Comparisons of the production of basic pig iron with the production of basic open-hearth steel ingots and castings are frequently made, in order to discover evidences of progressive changes in the consumption of pig iron and scrap respectively in the practice of the basic open-hearth process. It is somewhat curious that the ratio remains so constant. In 1914 the basic pig iron produced was equal to 59.43 per cent of the basic open-hearth steel ingots and castings. In 1913, a year of heavy production, the ratio was 61.63 per cent, while in 1912, a year likewise of heavy production, it was 58.13 per cent. Over a long period of years this ratio has increased, since it ranged from 40 to 45 per cent through 1903, then increasing until 1909, but in the past six years it has been quite constant at an average of but a trifle under 60 per cent. Minor variations from one year to another could, of course, be accounted for by fluctuations in stocks carried over.

To make a fine point, the decrease in the ratio from 61.63 per cent in 1913 to 59.43 per cent in

1914 might be attributed to the great decrease in duplexing, for in 1913 a total of 2,210,718 tons of basic open-hearth steel ingots and castings was made by the duplex process, or 11 per cent of the total basic open-hearth steel, while in 1914 the duplex steel amounted to 835,690 tons, or only 5 per cent of the total. Scrap is frequently used in the duplex process, however. In general it would appear that the steel industry is well committed to a practice of about 60 per cent pig iron and 40 per cent scrap in the basic open-hearth process.

The production of steel ingots in 1914 by all processes was 22,819,784 tons, while the rolled steel reported was 17,202,420 tons, showing a discrepancy of 5,617,364 tons. A small part of this was scale, while by far the major part was scrap, substantially all of which passed back to the furnace, a small part to acid open-hearth furnaces and by far the greater part to basic furnaces. The difference between the basic open-hearth steel ingots and castings and the basic pig iron reported was 6,600,442 tons. Thus it is apparent that the scrap used in the basic open-hearth process is made up chiefly of scrap produced in the steel mills, this being supplemented by scrap from works which fabricate the product of the steel mill and by old material.

An interesting computation is suggested, to throw light upon the question of how our steel-making capacity stands to-day. The annual report of the United States Steel Corporation notes that in 1914 its capacity was employed to an average extent of 62 per cent. Dividing the total production of ingots and castings in 1914 by 0.62 one obtains 38,000,000 tons. Since the average operation throughout the steel industry was perhaps a trifle less than that shown by the Steel Corporation, and since there have been some slight additions to capacity of late, there is a strong suggestion that our present capacity is over rather than under 38,000,000 tons a year, provided, of course, everything is working smoothly. A similar comparison would suggest that our capacity in rolled steel, weighing the respective materials in the form of wire rods, skelp, black plates for tinning, etc., is in the neighborhood of 28,000,000 tons a year.

Record Iron and Steel Exports

Iron and steel exports in June, as reported in last week's IRON AGE, made a new record for a month, by the comfortable margin of about 15 per cent. The total of the tonnage items in June was 355,829 gross tons, while the record had previously been held by May, 1912, at 308,000 tons. There was an increase of 93,000 tons from May to June, this year. It would be unsafe to assume that similar monthly increases are to occur in future, however, since it is known that on account of the non-arrival of many vessels expected in May there was a large tonnage of iron and steel piled on dock at the close of that month, and thus the May exports were impaired while the June exports may have been correspondingly swelled. However, the average of May and June, showing an annual rate of 3,700,000 tons, furnishes a fair working basis. It is known that the movement has been increasing, and exports in the present month may be at the rate of as much as 5,000,000 tons a year.

After considering these large tonnage exports, one must remember that the iron and steel exports not returned by weight are exceptionally heavy. Exports of metalworking machinery have passed all records, although exports of other classes of machinery have decreased. There are particularly heavy exports of automobiles, both passenger vehicles and trucks, and there are now, or soon will be, important exports of locomotives and freight cars. Then, of course, there are exports of shells, loaded and unloaded, involving in their manufacture tens of thousands of tons of steel per month. But with all proper allowance for indirect exportation of steel products it is probable that the total does not yet exceed 25 per cent of the manufacturing capacity now engaged, and is thus less than estimates made in some quarters. There is a tendency to confuse war business and exports, as though the latter were almost entirely due to the war. On the other hand there has been a disposition to think of the amount of current steel business contributed by the war as represented entirely by our exports of what has been purchased here by the belligerents or by those manufacturing for them abroad. Many orders for structural steel and machinery and a great variety of iron and steel products that have been going into home consumption, as for new plants to make munitions and supplies, and for increasing the capacity of plants manufacturing machinery for such work, must be reckoned in any estimate of the war's contribution to the steel trade's prosperity.

While there are no statistics showing the destination of our iron and steel exports as a whole, a comparison of the tonnages of the various products, item by item, with the exports in previous years, using the light of common knowledge as to some movements, makes it evident that the tonnage exports in June to neutral countries were at the rate of not over 1,500,000 tons a year, thus falling far short of the trade done with neutral countries in 1912 and 1913, when our export trade was at its best. At that time the non-producing countries were taking not much less than 10,000,000 tons of iron and steel from the great producing countries. British exports have lately been running at the rate of a trifle more than 3,000,000 tons annually, not including war material for the use of the English army on the Continent, but including such items as steel bars for French shell factories. British exports to the colonies and neutral countries are probably at less than 3,000,000 tons a year, so that the neutral and non-producing countries have been taking iron and steel at scarcely more than 4,000,000 tons a year, representing less than half their normal demand in good times. Their buying power had been curtailed somewhat before the war, and the outbreak of the war curtailed it still more severely, but apart from that influence was the fact that they were carrying stocks, and they would not be disposed to buy from a new source until those stocks were entirely exhausted. Assuming the exhaustion of stocks and some measurable improvement in their financial condition there is good reason to expect the demand upon us from neutral countries to increase materially in the next few months, while the war exports are, of course, quite unlikely to decrease while the war lasts.

War Time Shop Demands

Of all the obstacles metal-working establishments are meeting in their effort to supply the present abnormal demand none is giving more concern than difficulty with labor. One machine-tool builder writes that it is hard to get efficient help; another, that once found workmen have to be educated, and another is certain that more manufacturers would enlarge their plants if the labor supply were assured. Yet reports of machinists voting to strike have been coming in rapid-fire order, and this despite the many concessions which employers have granted of late. Not only are the men and their leaders making demands which would have been unthought of in ordinary times, but they are asking that their new hours and wages be made permanent. They would create a condition spelling ruin for many companies when the war status of industry passes away.

With many manufacturers who have not yet encountered labor trouble there is at least a latent fear that mechanics, instead of appreciating this dispensation of full employment at good wages after months of semi-idleness, will give heed to agitators who seek to stir up trouble. The situation is the more deplorable since the machine-tool industry is one of ups and downs. Its lean periods are so frequent that all concerned should want to make the most of the present activity and resent the intrusion of those who toil hardest in inducing workers to give up their jobs.

Good machinists are rightly accounted an intelligent class, generally able to do their own thinking, and perhaps for this reason the union has not so strong a hold upon them as on some other kinds of workers. Yet among them as elsewhere are chronic malcontents, usually the less competent, who would drag down to their level those who cheerfully and efficiently combine the work of hand and brain and upon whom appreciation and advancement are conferred when there is opportunity.

While it is not surprising that at a time of unusual profit for a conspicuous minority of manufacturers, these concerns are called on to make unusual terms with their men, the reckoning for some of the bargains now being forced is certain, even though postponed. Not only will these particular companies find some of these arrangements plaguing them when they get back to work yielding only normal profits, but the burden of short working time for machines and thus of high unit cost will be forced on industries that have had no chance to share in war prosperity, if that is what it is.

Getting Work Done Outside

Some manufacturers of machine tools have found that it does not always pay to have work done in other shops to relieve the pressure on order books. It is complained that parts made outside are unsatisfactory both as to cost and standards. Not all of those who let such contracts have had this experience, but there have been enough to justify comment. The trouble is explained in various ways. There are shops and shops. Supervision may be lax; there may be an absence of shop pride; or, the character of the regular product may not require such accuracy as the building of a machine tool.

Some builders, while successful in having parts made away from home, after their patterns and designs, have found the effort to have complete machines made outside altogether a failure. Their experience recalls the efforts of the Chinese a few years ago to duplicate a certain pneumatic tool. Skillful Chinese artisans carefully dissected the tool and with the utmost fidelity to detail reproduced each part. After assembly the original tool and its counterfeit could scarcely be told apart, yet the machine of Oriental fabrication would not work. Experts investigated and declared, with a show of Far East mysticism, that the soul of the machine was missing. A more practical statement is that the construction of complex machinery must be carried on in a regular and orderly way in a shop whose workers have caught the spirit of what is to be done.

Change in Goulds Selling Organization

The Goulds Mfg. Company, Seneca Falls, N. Y., manufacturer of pumps for every service, announces a change in the management of its sales department. Instead of having the entire organization in charge of a single executive, the work has been divided and is now directed by R. E. Hall, former manager of the Boston office, and W. E. Dickey, former manager of the New York office, both of whom are vice-presidents of the company. A. H. Whiteside, former sales manager, has resigned. Mr. Hall, who is now located at Seneca Falls, has charge of the general work of the department, and in addition looks after the business in all the Northern, Central Western and Northern Pacific States, including the territories of the Boston, Seneca Falls and Chicago offices. The export business is also under his supervision. Mr. Dickey, who will continue to make his headquarters at the New York office at 16 Murray Street, has charge of all business in Southern, Southwestern and Southern Pacific States, including the territories of the New York, Pittsburgh, Atlanta and Houston offices. W. H. Hopper, who has been with the company for over twenty years, succeeds Mr. Dickey as New York manager. C. W. Fulton, formerly works manager, has been appointed manager of the Boston office. The division of the sales work in the manner outlined is to give the Goulds customers service of a more personal nature.

The company has just opened a Pittsburgh office in the Henry W. Oliver Building under the management of H. H. Henderson, who has been representing the company in northern West Virginia and southeastern Ohio. E. C. Wayne, who has been in the main office at Seneca Falls, has been appointed assistant manager at Pittsburgh.

Americans who have business dealings with the countries of western Europe find it necessary at times to resort to the courts to secure an equitable solution of a transaction or an adjustment of differences. And, even in cases where a legal action is not contemplated, the American exporter feels that a knowledge of the specific requirements or procedure in any given commercial contingency is always desirable and occasionally imperative. To meet the unquestioned need for concise information of this kind the Bureau of Foreign and Domestic Commerce has just issued a monograph on "Commercial Laws of England, Scotland, Germany, and France" as No. 97 in its Special Agents Series. It may be obtained for 15 cents from the Superintendent of Documents, Washington, D. C.

C. E. Hoyt, secretary of the Foundry and Machine Exhibition Company, announces that he has established his headquarters in the machinery exhibit department of the Bourse, Philadelphia, Pa., and will be found there until Sept. 15. After that date his headquarters will be at Young's Million Dollar Pier, Atlantic City, N. J.

LARGER ARMY AND NAVY

Features in the Administration's Program—Some Labor Opposition

WASHINGTON, D. C., Aug. 17, 1915.—Administration plans for legislation to equip the United States to wage offensive or defensive warfare have reached the stage where the responsible officials are figuring on the cost. President Wilson is committed to a comprehensive program of military preparedness. He has directed the Secretary of War, the Secretary of the Navy and other officials to submit estimates of the cost of the primary plans in course of preparation by the War and Navy departments, also the probable cost of alternative proposals that will have consideration when the time comes to transmit recommendations to Congress.

Last year the naval appropriation was under $150,000,000. Approximately $100,000,000 was voted for the army. Experts in the Navy Department have informally submitted a building program that would cost $100,000,000, bringing the expenditures of the navy in the fiscal year beginning July 1, 1916, to about $250,000,000. The tentative plans of the War Department contemplate an additional expenditure of $100,000,000, which would bring the army budget up to $200,000,000. The President's advisers appear to believe he will insist upon a compromise, limiting the additional appropriations for the army and the navy to about $150,000,000.

It is known to be the purpose of the President to recommend larger appropriations for the navy than for the army, and indications are that the naval budget to be passed by Congress will authorize the largest building program in the history of the Government.

The plans for the reorganization of the army and its equipment in consonance with modern standards are well advanced. They provide for an increase in the size of the mobile army, for an enlargement of the coast defenses and for more and better equipment all round. In addition, they propose the creation of a reserve system and embody methods that will be recommended to diffuse military education among the great mass of the people.

Completion of the naval program to be submitted to Congress will be deferred until late in the fall, to enable the department to gain the latest intelligence concerning lessons in naval warfare taught by the war in Europe. The general naval board last year recommended 4 battleships, 16 destroyers, 3 fleet submarines, 16 coast submarines, 4 scouts, 4 gunboats, 2 oil fuel ships, 1 destroyer tender, 1 submarine tender, 1 transport, 1 hospital ship, 1 supply ship, also $500,000 for aerial service. This will be the basis of the program to be prepared this fall. The board may also include one or more battleship cruisers, a style of craft that has not been favored in the past by American naval experts, and may add to the number of submarines.

The administration does not look for a partisan alignment in Congress on the military program. Advocates of universal peace are already condemning the Administration's determination to force Congress to increase appropriations for the army and the navy. Members of the labor group in Congress will fight the policy of preparedness. This is indicated in the recent activities of "Labor's National Peace Council," which has the backing of Representative Frank H. Buchanan of Illinois and other labor leaders. The Federation of Labor, through its president, Samuel Gompers, has repudiated the Buchanan organization. Other members of the House identified with labor will oppose the military program unless it expressly provides that all munitions of war, including battleships, shall be constructed in Government plants. Notable among those who take this view is Representative Clyde H. Tavenner of Illinois. Mr. Tavenner has repeatedly made the charge that there is an "armor ring," an "ammunition ring" and a "shipbuilding trust." He insists that these organizations favor a larger navy for selfish purposes. Despite these antagonistic elements the Administration appears to be convinced that Congress will not overlook at this juncture in the world's affairs the obvious needs of the army and the navy of the United States. W. L. C.

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Bethlehem Buys Detrick & Harvey Plant

The Bethlehem Steel Company has purchased the plant of the Detrick & Harvey Machine Company, Baltimore, Md. It is stated by an official of the steel company that the plant is a machine shop of general character which has been doing a great deal of work for it in times past, and that, in all probability, it will continue to be operated on its present basis and capacity. The Bethlehem Steel Company has no intention of manufacturing ammunition at the plant as was reported. The Detrick & Harvey Machine Company, of which J. S. Detrick is president, and Curran W. Harvey, secretary and treasurer, manufactures open-side planers, horizontal drilling and boring machines, vertical boring and turning mills and special machinery. It was formed in 1884 by John S. Detrick and Alexander Harvey. On the death of Mr. Harvey last November his son, Curran W. Harvey, succeeded to his interest.

Concerning rumors that the Allis-Chalmers Mfg. Company, Milwaukee, Wis., has or is about to become a part of the Bethlehem Steel Company, Gen. Otto H. Falk, president of the former company, says: "There is no foundation for such a rumor. We are subject to many such reports. If we denied all of them we would hardly have time to take care of our growing business. We are doing work for a great many companies, among them machine work for the Bethlehem Steel Company."

The Princess Furnace Company blew in its furnace at Glen Wilton, Va., Aug. 2, after an idleness of many months. Its capacity is about 100 tons a day.

The Iron and Metal Markets

MORE RUSSIAN RAILS

Bessemer Tonnage Welcomed by Mills

Foreign Buying Still Increasing—Advances in Bars, Plates and Shapes

There is no let-up in the new inquiry for steel for the warring countries and with each week the percentage of mill output that will be shipped abroad in some form is increasing. The evidence that this export business will continue for months on the present or a greater scale counts largely in the predictions of further broadening of the industry.

Russia's Bessemer rail purchases are large and more are to come. The Steel Corporation has just closed for 65,000 tons, which will be rolled at the rate of 1000 tons a day at Chicago and is more than welcome in giving employment to Bessemer capacity in all the rush for open-hearth steel. The Cambria Steel Company's share under the new readjustment is apparently 60,000 tons of which 40,000 tons is to be rolled by the Pennsylvania Steel Company.

Russia is also placing here 10,000 tons of spikes or more, of which an Eastern maker has taken a large part.

The French Government's pending inquiry for large rounds is about 100,000 tons. Italian steel companies have asked for one lot of 15,000 tons of steel billets and another of 20,000 tons.

With better employment for its Bessemer capacity the Steel Corporation's ingot percentage is now about 94. Its purchases of billets a few weeks ago, which came just before the sharp advance in semi-finished steel, were not far from 100,000 tons.

Just now specifications are coming to the mills in excess of the rate of new buying, and deliveries are not as prompt in some lines as buyers want. At the same time prices are tightening, though very gradually, and this week one Pittsburgh interest has announced a 1.35c. basis for bars, plates and shapes for any delivery this year. All can be had at 1.30c. from some sellers, and 1.25c., Pittsburgh, for plates is still possible.

It is appreciated that available open-hearth steel capacity is now about all at work and owners of nearly completed basic furnaces are pushing work to get them in operation quickly. The Steel Corporation still has a dozen idle blast furnaces which could make basic iron to advantage, but other stacks now running are due for repairs.

Domestic railroad orders are of little moment. The C. & O. has bought 7000 tons of rails. The B. & O. has placed 1000 steel hopper car bodies, following its 11,000 tons of rails, and the Atlantic Coast Line has bought 800 box cars.

There is a better supply of structural work, but fabricating prices are no higher. Pittsburgh contracts of the week include one of 7500 tons and another of 6000, the latter making a total of 17,000 tons for the Eddystone, Pa., munitions plant. The Bridge Builders and Structural Society reports July business representing 86 per cent of the country's capacity.

As spelter tumbles readjustments are being made in galvanized products. Pipe up to 6-in. diameter was reduced $12 a ton this week and larger sizes $8 a ton, representing about half the advances due to the skyrocketing of the metal. Galvanized sheets are down to 3.60c. for No. 28, and galvanized wire reductions are on the way.

A new feature in bars is the buying of billets by iron rolling mills which have gone into the rolling of steel rounds for shrapnel. At Chicago some sales of Canadian billets for this purpose have been made at about $22 delivered.

Good-sized sales of tin plates have been made for export since British exports were cut off. Pittsburgh recently booked two lots of 25,000 boxes each for South America.

Pig-iron buying has been less since the repeated advances in prices. Buffalo has been more active than other markets. Thus far the efforts of furnaces to keep 1916 buying in abeyance have not met much resistance from consumers, and buying for next year is still the exception. In the past week foundry iron has been marked up an additional 50 cents in most districts, but talk of a runaway market was quite premature, at least.

Southern iron has sold at $11 for early delivery and at $11.50 for the last quarter of the year. At $12.50, which has been asked for 1916 delivery, few sales have been made as yet.

Bessemer iron has advanced to $15.25 at Valley furnace and at that price a 3000-ton sale was made for export to Italy.

Ferrosilicon is scarcer in Great Britain and has advanced there about $5 in the past week to $75 for 50 per cent. Considerable exports from Canada have been made to Great Britain and France.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics

At date, one week, one month and one year previous

	Aug. 18, 1915.	Aug. 11, 1915.	July 21, 1915.	Aug. 19, 1914.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia...	**$15.00**	$14.75	$14.25	$14.75
No. 2, Valley furnace...	13.25	13.25	12.75	13.00
No. 2, Southern, Cin'ti...	13.90	13.90	12.65	13.25
No. 2, Birmingham, Ala..	11.00	11.00	9.75	10.00
No. 2, furnace, Chicago*.	**13.50**	13.25	13.00	13.75
Basic, del'd, eastern Pa..	**15.50**	15.25	14.00	14.00
Basic, Valley furnace....	**14.25**	14.00	13.00	13.00
Bessemer, Pittsburgh....	**16.20**	15.95	14.95	14.90
Malleable Bess., Ch'go*..	**13.50**	13.25	13.00	14.00
Gray forge, Pittsburgh..	**14.20**	13.95	13.45	13.65
L. S. charcoal, Chicago..	**16.25**	15.75	15.75	15.75
Billets, etc. Per Gross Ton:				
Bess. billets, Pittsburgh..	**23.50**	23.00	22.00	20.50
O.-h. billets, Pittsburgh..	**24.00**	23.50	22.00	20.50
O.-h. sheet bars, P'gh....	**24.50**	24.00	23.00	21.50
Forging billets, P'gh.....	**29.00**	28.00	28.00	26.00
O.-h. billets, Phila.....	30.00	30.00	24.56	23.40
Wire rods, Pittsburgh...	27.00	27.00	25.50	25.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia..	**1.450**	1.40	1.22½	1.17½
Iron bars, Pittsburgh....	1.30	1.30	1.25	1.20
Iron bars, Chicago.....	**1.25**	1.20	1.20	1.07½
Steel bars, Pittsburgh...	1.30	1.30	1.25	1.20
Steel bars, New York....	1.469	1.469	1.419	1.36
Tank plates, Pittsburgh..	1.25	1.25	1.25	1.20
Tank plates, New York..	**1.469**	1.419	1.369	1.36
Beams, etc., Pittsburgh..	1.30	1.30	1.25	1.20
Beams, etc., New York..	1.469	1.469	1.419	1.36
Skelp, grooved steel, P'gh	1.25	1.25	1.20	1.20
Skelp, sheared steel, P'gh	1.30	1.30	1.25	1.25
Steel hoops, Pittsburgh..	1.30	1.30	1.30	1.30

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,

	Aug. 18, 1915.	Aug. 11, 1915.	July 21, 1915.	Aug. 19, 1914.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh.	1.85	1.85	1.75	1.90
Sheets, galv., No. 28, P'gh.	3.60	3.85	4.50	2.90
Galv. sheets, Pittsburgh	1.60	1.60	1.60	1.55
Wire nails, Pittsburgh	1.60	1.60	1.55	1.60
Cut nails, Pittsburgh	1.40	1.40	1.40	1.35
Fence wire, base, P'gh.	2.50	2.50	2.40	1.95
Barb wire, galv., P'gh.				

Old Material, Per Gross Ton:

Iron rails, Chicago	$12.25	$12.25	$12.25	$12.00
Iron rails, Philadelphia	16.00	15.50	15.50	14.00
Carwheels, Chicago	11.75	11.50	11.25	11.25
Carwheels, Philadelphia	13.50	13.00	12.50	11.50
Heavy steel scrap, P'gh.	14.00	14.00	12.75	11.25
Heavy steel scrap, Phila.	14.00	13.50	12.25	10.50
Heavy steel scrap, Ch'go.	11.75	11.50	10.50	9.75
No. 1 cast, Pittsburgh	13.00	12.50	12.25	11.50
No. 1 cast, Philadelphia	13.50	13.00	12.50	12.00
No. 1 cast, Ch'go (net ton)	9.50	9.50	9.25	9.50

Coke, Connellsville,

Per Net Ton at Oven:				
Furnace coke, prompt	$1.50	$1.50	$1.60	$1.70
Furnace coke, future	1.75	1.75	1.75	1.75
Foundry coke, prompt	2.00	2.00	2.00	2.25
Foundry coke, future	2.25	2.25	2.25	2.35

Metals.

Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	19.00	20.00	22.00	12.75
Electrolytic copper, N. Y.	16.75	17.75	19.00	12.25
Spelter, St. Louis	11.50	14.00	20.00	5.60
Spelter, New York	11.75	14.25	20.25	5.75
Lead, St. Louis	4.35	4.40	5.50	3.70
Lead, New York	4.50	4.50	5.55	3.87½
Tin, New York	34.50	34.62½	36.62½	49.00
Antimony, Asiatic, N. Y.	33.50	33.50	35.50	14.00
Tin plate, 100-lb. box, P'gh.	$3.10	$3.10	$3.10	$3.50

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 13.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 13.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 22.9c.; Denver, 68.6c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c.. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal has no stability, being dependent on vessel charges.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.25c. base net cash, 30 days. Following are stipulations prescribed by manufacturers:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated Feb. 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft. are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gage or weight to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gages under ¼ in. to and including 3-16 in.	.10
Gages under 3-16 in. to and including No. 8	.15
Gages under No. 8 to and including No. 9	.25
Gages under No. 9 to and including No. 10	.30
Gages under No. 10 to and including No. 12	.40
Sketches (including straight taper plates), 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths under 3 ft. to 2 ft., inclusive.	.25
Cutting to lengths under 2 ft. to 1 ft., inclusive.	.50
Cutting to lengths under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Wire Products.—Prices to jobbers: Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, $1.40; galvanized, $2.20. Galvanized barb wire and staples, $2.50; painted, $1.70. Wire nails, $1.60. Galvanized nails, 1 in. and longer, $1.75 advance over base price; shorter than 1 in., $2.25 advance over base price. Woven wire fencing 69 per cent off list for carloads; 68 off for 1000-rod lots; 67 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized	2.45	2.50	2.55	2.60	2.70	2.80	3.10	3.20

Wire Rods.—Bessemer, open-hearth and chain rods, $27 to $28.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, 3 in. and over, 1.30c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths under 3 ft., to 2 ft. inclusive.	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive.	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from Aug. 16, 1915, all full weight:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	72	46½	⅛ and ¼	64	37
½	76	59½	⅜	64	37
¾ to 3	79	63½	½	68	47
			¾ to 2½	71	52

Lap Weld

2	76	60½	1¼	55	36
2½ to 6	78	62½	1½	66	47
7 to 12	76	58½	2	67	49
13 and 14	62½	..	2½ to 4	69	52
15	60	..	4½ to 6	69	52
			7 to 12	67	50

Reamed and Drifted

1 to 3, butt	77	61½	1 to 1½, butt	69	50
2, lap	74	58½	2, butt	69	50
2½ to 6, lap	76	60½	1¼, lap	53	34
			1½, lap	64	45
			2, lap	65	47
			2½ to 4, lap	67	50

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	67	49½	⅜	61	43
½	72	58½	½	66	51
¾ to 1½	76	62½	¾ to 1½	70	53
2 to 3	77	63½	2 and 2½	71	54

Lap Weld, extra strong, plain ends

2	73	57½	1½	65	48
2½ to 4	75	59½	2	67	49
4½ to 6	74	58½	2½ to 4	69	52
7 to 8	68	50½	4½ to 6	68	51
9 to 12	63	45½	7 to 8	61	44
			9 to 12	56	39

Butt Weld, double extra strong, plain ends

½	62	48½	½	56	40
¾ to 1½	65	51½	¾ to 1½	59	43
2 to 2½	67	53½	2 and 2½	61	45

Lap Weld, double extra strong, plain ends

2	63	49½	2	57	40
2½ to 4	65	51½	2½ to 4	59	45
4½ to 6	64	50½	4½ to 6	58	44
7 to 8	58	40½	7 to 8	51	33

To the large jobbing trade an additional 5 per cent is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on the black and three (3) points on galvanized.

Boiler Tubes.—Discounts on less than carloads, f.o.b. Pittsburgh, freight to destination added, in effect from July 16, 1915.

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	63	1¾ and 2 in.	50
2¼ in.	60	2¼ in.	47
2½ to 2¾ in.	66	2½ and 2¾ in.	54
3 and 3¼ in.	71	3 and 3¼ in.	58
3½ and 4½ in.	72	3½ and 4½ in.	60
5 and 6 in.	65	5 and 6 in.	54
7 to 13 in.	62		

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gage, in carload and larger lots, on which jobbers charge the usual advance for small lots

from store, are as follows, f.o.b. Pittsburgh, terms 30 days net, or 2 per cent cash discount in 10 days from date of invoice.

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	1.30 to 1.45
Nos. 9 to 16	1.35 to 1.50
Nos. 11 and 12	1.40 to 1.55
Nos. 13 and 14	1.50 to 1.65
Nos. 15 and 16	1.60 to 1.75

Box Annealed Sheets, Cold Rolled

	Cents per lb.
Nos. 10 and 11	1.50 to 1.55
No. 12	1.50 to 1.55
Nos. 13 and 14	1.55 to 1.60
Nos. 15 and 16	1.60 to 1.65
Nos. 17 to 21	1.65 to 1.70
Nos. 22 and 24	1.70 to 1.75
Nos. 25 and 26	1.75 to 1.80
No. 27	1.80 to 1.85
No. 28	1.85 to 1.90
No. 29	1.90 to 1.95
No. 30	2.00 to 2.05

Galvanized Sheets of Black Sheet Gage

	Cents per lb.
Nos. 10 and 11	2.60 to 2.75
No. 12	2.70 to 2.85
Nos. 13 and 14	2.70 to 2.85
Nos. 15 and 16	2.80 to 2.95
Nos. 17 to 21	2.95 to 3.10
Nos. 22 and 24	3.15 to 3.30
Nos. 25 and 26	3.30 to 3.45
No. 27	3.45 to 3.60
No. 28	3.60 to 3.75
No. 29	4.35 to 4.50
No. 30	4.60 to 4.75

Pittsburgh

PITTSBURGH, PA., Aug. 17, 1915.

The higher prices on pig iron, billets, sheet bars and scrap have not only been fully maintained, but there have been further advances. Persistent reports are out that the Steel Corporation is about to buy, or has already bought, a very large block of basic iron and some Bessemer iron, but confirmation has not been obtained. It is said offers have been made of as high as $26 at works, Youngstown, for open-hearth steel billets or sheet bars for delivery in fourth quarter. If such an offer was made, the intending buyer is simply taking a chance on the market on steel going up $2 or $3 a ton between now and October. The heavy decline in spelter is reflected in the reduction of $12 per ton on galvanized iron and steel pipe up to 6 in. in diameter, and $8 on sizes larger than 6 in., announced by the leading pipe companies and effective from Monday, Aug. 16. An early reduction in prices of galvanized wire products is looked for. The steel works and manufacturing plants that are making shrapnel are running night and day, one large machine shop having operated last Sunday on war orders, but it is not believed this will be continued. There is still a very heavy demand for steel rounds for shrapnel purposes, but local steel-bar mills are now so well filled that they are not in position to take much more work for delivery this year. Prices on finished lines of iron and steel are very firm, and an advance in bolts is looked for this week. The situation in scrap is strong, but there was not as much activity the past week as the week before, some dealers believing that prices were being driven up too fast, and that the market may be due for a slight reaction. Coke is quiet and prices are soft.

Pig Iron.—Fairly heavy sales have been made of Bessemer and basic and at full prices. However, reports of heavy sales of basic iron at $14.50 are not confirmed, and are not believed to be correct. Bessemer has advanced squarely to $15.25 at Valley furnace and basic is firm at $14, with reports of sales as high as $14.25. Malleable Bessemer has gone up sharply, selling at $14, Valley furnace. Foundry iron has also advanced to $14, Valley furnace, with some sellers asking $14.50. We note sales of 3000 tons, 1300 tons, and 1000 tons of standard Bessemer pig iron at $15.25 and about 3000 tons for export to Italy at the same price. A sale of 5000 tons of basic for delivery over the ext five months, 1000 tons a month, is reported at $14, Valley furnace. We also note a sale of 1500 tons of malleable Bessemer iron at $14, Valley furnace. We quote: Standard Bessemer iron, $15.25; basic, $14 to $14.25; malleable Bessemer, $14; No. 2 foundry, $14 to $14.50; gray forge, $13.25 to $13.50, at Valley furnace, the freight rate for delivery in the Pittsburgh or Cleveland districts being 95c. per ton.

Billets and Sheet Bars.—The inquiry has quieted down to some extent, consumers evidently being well covered, but deliveries from the mills are unsatisfactory. One large steel concern is reported to be four to five weeks behind, and another steel interest is trying to buy in the open market to help out on its contracts. Forging billets are very scarce. All sorts of prices are heard of on billets and sheet bars, especially for prompt delivery. The actual market is represented by the following prices: Bessemer billets, $23; open-hearth billets, $24; Bessemer sheet bars, $24, and open-hearth sheet bars, $24.50, Youngstown. Bessemer billets, $23 to $23.50; open-hearth billets, $24 to $24.50; Bessemer sheet bars, $24, and open-hearth sheet bars, $24.50, f.o.b., Pittsburgh mills. We quote forging billets at $29 to $30 for sizes up to but not including 10 x 10 in., and for carbons up to 0.[illegible] the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.[illegible] and up to 0.60 carbon take $1 per ton extra. Axle billets are held at $26.

Ferroalloys.—There is a fair amount of new inquiry for small lots of ferromanganese for prompt shipment, which are held at about $105, seaboard, with reports that on a firm offer $100 might be done. English 80 per cent ferromanganese on contracts is quoted at $100, seaboard, but with no guarantee as to deliveries. Prices on blast furnace ferrosilicon are up another 50c. We quote 50 per cent ferrosilicon in lots up to 100 tons, at $73; over 100 tons to 600 tons, $72, and over 600 tons, $71, delivered in the Pittsburgh district. We quote 10 per cent Bessemer ferrosilicon at $18; 11 per cent, $19; 12 per cent, $20, all f.o.b. cars at furnace, Ashland, Ky., Jackson, or New Straitsville, Ohio, each of these points having a rate to Pittsburgh of $2 per gross ton. We quote 20 per cent spiegeleisen at $25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads, 10c. in 2000-lb. lots and over, and 12½c. in smaller lots.

Structural Material.—New inquiry is more active, and some large jobs have been closed. The Jones & Laughlin Steel Company has taken 7500 tons for a new warehouse to be built by the Pittsburgh & Lake Erie Railroad in this city. The McClintic-Marshall Company has taken 6000 tons more for new buildings for the Baldwin Locomotive Works at Eddystone, Pa., making about 17,000 tons in all that it has taken for the new plant. Local fabricating shops report they are running to 100 per cent of capacity and have a large amount of work ahead. Prices are very firm, and we quote beams and channels up to 15 in. at 1.30c., f.o.b., Pittsburgh.

Plates.—Some orders for cars were placed in the past week, but they were relatively small. The Baltimore & Ohio has divided 1000 steel hopper car bodies, the Pressed Steel Car Company and the American Car & Foundry Company getting 300 each, and the Cambria Steel Company 400. The Pressed Steel Car Company has also taken 50 steel mine cars for the Wyoming Coal Company, 10 steel tank cars for the Tennessee Coal, Iron & Railroad Company, and 18 flat cars for the Pittsburgh Crucible Steel Company. The Michigan Central is in the market for 1500 to 2000 all-steel box cars, and 500 to 1000 all-steel automobile cars, and the Atlantic Coast Line for 800 box cars. The Western Maryland is asking bids on 1000 hopper cars, and the Texas & Pacific on 400. It is stated that a large Eastern railroad will send out inquiries this week for 2000 refrigerator cars. The general demand for plates is good, and local mills are filled up for two or three months. Prices are firm and we continue to quote ¼ in. and heavier plates at 1.25c. to 1.30c., very desirable orders still being taken by a few of the smaller mills at the lower price.

Steel Rails.—The report is confirmed that the Cambria Steel Company will roll 60,000 tons of rails for Russia, 40,000 tons of the same order going to the Pennsylvania Steel Company. On the Cambria contract 10,000 tons are to be shipped each in August and Sep-

ember, and 40,000 tons in October. The Cambria Company has also taken 500 tons for the Chesapeake & Ohio. Domestic orders for standard section steel rails are mostly for small lots for early shipment. The new demand for light rails is active, especially from the coal mining companies, the Carnegie Company having taken in the past week, in new orders and specifications, about 3500 tons. We quote standard section rails of Bessemer stock at 1.25c., and of open-hearth, 1.34c., f.o.b. Pittsburgh. We quote light rails as follows, in carload lots: 8 and 10-lb. sections, 1.275c.; 12 and 14-lb., 1.225c.; 16 and 20-lb., 1.175c.; 25, 30, 35, 40, and 45-lb. sections, 1.125c. The prices of light rails are materially shaded on large lots.

Sheets.—The rapid decline in spelter has resulted in lower prices on galvanized sheets, which are now being offered as low as 3.60c. for No. 28 gage, with the probability that the price will decline still further. The demand for black and blue annealed sheets is better than for some time and prices are firm. On No. 28 black sheets 1.85c. seems to be minimum, and on blue annealed 1.35c., with some makers holding for 1.40c. The American Sheet & Tin Plate Company is operating this week to about 80 per cent of its hot mill capacity, and expects to increase this rate in the near future. We quote No. 28 galvanized sheets at 3.60c. to 3.75c.; No. 28 Bessemer black sheets, 1.85c. to 1.90c.; Nos. 9 and 10 blue annealed sheets, 1.35c. to 1.50c.; No. 30 black plate, tin-mill sizes, H. R. & A., 1.95c.; No. 28, 1.90c.; Nos. 27, 26 and 25, 1.85c.; Nos. 22 to 24, 1.80c.; Nos. 17 to 21, 1.75c.; Nos. 15 and 16, 1.70c. The above prices are for carload lots, f.o.b. at maker's mill, jobbers charging the usual advances for small lots from store.

Tin Plate.—Foreign inquiry for tin plate from England for re-export to India, China, Japan and South America, is heavy and local mills are making foreign shipments regularly. Two lots of 25,000 boxes each were closed recently for shipment to South America. One local maker is holding tin plate at $3.20, base, for export. Specifications are reported fairly active, but new demand is dull and only for small lots. The American Sheet & Tin Plate Company is operating this week to 94 per cent of its hot mill capacity, and several of the other large makers are running to 100 per cent, with orders ahead for six to seven weeks. We quote 14 x 20 coke plates at $3.10 to $3.20 per base box, f.o.b. Pittsburgh.

Wire Rods.—Prompt wire rods are scarce and the market is very firm. One local maker has quoted $27 on a round lot of open-hearth rods for delivery in the first half of 1916. Foreign inquiry is active, and 2000 to 2500 tons of open-hearth rods were sold recently at close to $28, Pittsburgh. Specifications against contracts are coming in actively. We quote Bessemer, open-hearth, and chain rods at $27 to $28, f.o.b. Pittsburgh.

Wire Products.—The new demand for wire is active. Wire nails are quiet but a heavy demand is looked for starting with September. Foreign inquiry for barb wire and other grades is active and heavy foreign shipments are being made steadily. The heavy decline in spelter will probably result before long in the spread on galvanized products being reduced from 80c. to probably 50c. Prices to the large trade are as follows: Wire nails, $1.60; galvanized nails 1 in. and longer taking an advance over this price of $1.75, and shorter than 1 in., $2.25. Some mills are asking higher prices on galvanized nails. Plain annealed wire is $1.40; galvanized barb wire and fence staples, $2.50; painted barb wire, $1.70; polished fence staples, $1.70, all f.o.b. Pittsburgh, with freight added to point of delivery, terms sixty days net, less 2 per cent off for cash in ten days. Prices on woven wire fencing are 69 per cent off in carload lots, 68 per cent on 1000-rod lots, and 67 per cent on small lots, f.o.b. Pittsburgh.

Skelp.—While the mills are pretty well filled on orders taken some time ago, the new demand is only fair. There is still some foreign inquiry and several sales of moderate quantities have recently been made for export. We quote grooved steel skelp at 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.65c. to 1.70c., and sheared iron skelp, 1.75c. to 1.80c., delivered to consumers' mills in the Pittsburgh district.

Railroad Spikes.—Nearly all the railroads being covered, there is not much new demand. Makers report that specifications are coming in only at a fair rate, the railroads doing very little laying of new rails this year. It is stated that part of the order for 75,000 to 100,000 kegs of what are known as dog-eared spikes, for shipment to Russia, has been placed with an Eastern maker. So far none of this order has come to local interests. We quote standard sizes of railroad spikes at $1.45, and small railroad and boat spikes at $1.55 per 100 lb., f.o.b. Pittsburgh.

Cold-Rolled Strip Steel.—The new demand is quite active, and there is a large amount of inquiry for cold-rolled strip steel for export. One local maker has recently shipped several large lots to England and France. The minimum to the large trade on new orders is now $2.85 base, and sales have been made as high as $2.95 on good sized lots for delivery over remainder of this year and into first quarter of 1916. Several of the larger makers state that they are practically out of the market, having their entire output for the remainder of this year under contract. We quote hard-rolled steel, 1½-in. and wider, under 0.20 carbon, sheared or natural mill edge, per 100 lb., $2.85 to $2.95, delivered. Extras, which are standard among all mills, are as follows:

Thickness, in.	Extras for thickness	Extras for soft or intermediate tempers	Extras for straightening and cutting to lengths not less than 24 in.
0.100 and heavier	Base	$0.25	$0.10
0.099 to 0.050	$0.05	0.25	0.15
0.049 to 0.035	0.20	0.25	0.15
0.034 to 0.031	0.35	0.40	0.25
0.030 to 0.025	0.45	0.40	0.40
0.024 to 0.020	0.55	0.40	0.50
0.019 to 0.017	0.85	0.50	1.10
0.016 to 0.015	1.25	0.50	1.10
0.014 to 0.013	1.95	0.50	1.25
0.012	2.30	0.50	coils only
0.011	2.65	0.50	coils only
0.010	3.00	0.50	coils only

Rivets.—Makers report a very active domestic and foreign demand and are filled up for some time ahead. Foreign shipments are quite heavy, local makers having recently sent five or six carloads abroad. Prices are firm. We quote buttonhead structural rivets at $1.60, and conehead boiler rivets at $1.70 per 100 lb., f.o.b. Pittsburgh, small lots bringing about 10c. advance.

Hoops, Bands and Cotton Ties.—Mills report a very active demand, heavier than at any time in more than a year, and makers are now pretty well sold up for the remainder of this year. The bulk of the business in cotton ties for this season was placed in July, on which shipments have been heavy for some time. We quote steel hoops at 1.30c. to 1.40c., and bands at 1.30c., the latter taking the steel-bar card extras. The Carnegie Steel Company reports that its minimum price on steel hoops is 1.40c. On cotton ties for August shipment, 85½c. per bundle is quoted.

Iron and Steel Bars.—There is no let-up in the heavy demand for rounds for shrapnel purposes, and local mills report they are almost deluged with inquiries, most of which they cannot consider, as their capacity is sold up for some months ahead. The Carnegie Steel Company last week took 5500 tons of 3¼-in. rounds for shipment to Baltimore. It is said that France is in the market for over 100,000 tons, but it is not likely much of this business, if it is placed, will come to Pittsburgh mills. On the smaller sizes of steel bars local mills report they are back in deliveries from six to seven weeks. The new demand for iron bars is also more active, and prices are firm. Steel bars for reinforcing purposes are active, but prices are ruling low. We quote steel bars at 1.30c. for third quarter; common iron bars, 1.30c.; refined iron bars, 1.35c. to 1.40c., and test iron bars, 1.40c. to 1.45c., all f.o.b. Pittsburgh.

Nuts and Bolts.—Local makers report foreign demand very active, and heavy shipments of bolts abroad are being made regularly. Specifications for bolts for export are much different from those for the domestic

trade, and in some cases nearly 50 per cent higher prices are obtained, but there is a good deal more material in bolts for export, and the packages are also more expensive for the manufacturers to furnish. However, makers state that prices realized on foreign trade for bolts are better than for domestic. The domestic demand is also active and prices are firm. It is not unlikely there will be an advance in prices of bolts made this week. Discounts to the large trade are as follows:

U. S. S. Cold Punched Blank and Tapped, Chamfered, Trimmed and Reamed

½ in. and smaller, hex.....7.4c. per lb. off
⅝ in. and larger, hex.....6.9c. per lb. off
Square, all sizes .....5.5c. per lb. off

Semi-Finished Tapped

½ in. and smaller, hex.....85-10-5 off
⅝ in. and larger, hex.....85-5 off

Black Bulk Rivets

7/16 x 6½, smaller and shorter.....80-10 off

Package Rivets 1000 Pcs.

Black, metallic tinned and tin plated....75-10-10 off

Discounts on bolts to the large trade, effective from July 21, are as follows:

Machine bolts, h. p. nuts, ⅜ x 4 in., smaller and shorter, rolled, 75, 10, 10 & 10; smaller and shorter, cut, 75, 10, 10 & 5; larger or longer, 75 & 10. Machine bolts, C. P. C. & T. nuts, ⅜ x 4 in., smaller and shorter, 75, 10 & 7½; larger or longer, 70, 10 & 7½. Common carriage bolts, ⅜ x 6 in., smaller and shorter, rolled, 75, 10, 10 & 5; smaller and shorter, cut, 75, 10 & 10; larger or longer, 75 & 5. Bolts without nuts, 6 in. and shorter, extra 10; longer lengths, extra, 5. Blank bolts, 75 & 10. Bolt ends with h. p. nuts, 75 & 10; C. P. C. & T. nuts, 70, 10 & 7½. Gimlet point coach screws and cone point lag screws, 80 & 15. Nuts, blank or tapped, h. p. square, 6c. lb. off; h. p. hexagon, 6.70c. lb. off; C. P. C. & T. square, 5.50c. lb. off; hexagon, ⅝ in. and up, 7c. lb. off; smaller, 7.50c. lb. off; C. P. plain, square, 5.40c. lb. off; hexagon, 5.80c. lb. off; C. P. semi-finished, hexagon, ⅝ in. and up, 85 & 10; smaller, 85, 10 & 10.

Merchant Steel.—The new demand is reported heavy, and specifications against contracts are active. Shipments by the mills in August will be heavier than in July, which was a record month for a long time. Due to the scarcity and high prices for raw materials, the market is higher, and on small lots we now quote: Iron finished tire, ½ x 1½ in. and larger, 1.60c. base; under ½ x 1½ in., 1.75c.; planished tire, 1.80c.; channel tire, ¾ to ⅞ and 1 in., 2.10c. to 2.20c.; 1 x ⅛ in. and larger, 2.20c.; toe calk, 2.20c. to 2.30c. base; flat sleigh shoe, 1.95c.; concave and convex, 2c.; cutter shoe, tapered or bent, 2.50c. to 2.60c.; spring steel, 2.20c. to 2.30c.; machinery steel, smooth finish, 2c.

Wrought Pipe.—Effective on Monday, Aug. 16, discounts on galvanized iron and steel pipe were increased six points on all sizes up to 6 in., which is a reduction of $12 per ton, and on all sizes over 6 in., four points, or a reduction of $8 per ton. This heavy reduction was made on account of the sharp decline in prices of spelter. The contract of the J. G. White Corporation of New York City for 120 miles of 8-in. line pipe has been held up for ten days or two weeks until some necessary rights-of-way have been secured. The general demand for merchant iron and steel pipe is quiet, and mostly for lots to round out stocks carried by jobbers, which are reported heavy. Discounts are fairly well maintained.

Boiler Tubes.—The new demand for boiler tubes is quite active, and several large contracts have lately been placed with local mills for delivery over remainder of this year and into first quarter of 1916. Discounts on both steel and charcoal iron tubes continue to be shaded.

Coke.—The local situation is quiet and prices are soft. It is understood that the Lackawanna Steel Company has closed for a monthly shipment of furnace coke for delivery in last quarter of this year, the business going to a local interest. No large inquiries are in the market, but if more merchant stacks in the Shenango Valley go in operation, they will likely buy soon. Standard grades of furnace coke for prompt shipment are still offered at $1.50 to $1.60, while on contracts for remainder of the year prices quoted range from $1.75 to $1.85 per net ton at oven. Some contracts for foundry coke for delivery in last quarter have been closed. We quote standard makes of 72-hr. foundry coke for prompt shipment at $2 to $2.25, and on contracts for remainder of the year $2.25 to $2.50 per net ton at oven. The Connellsville *Courier* gives the output of coke in the upper and lower Connellsville regions for the week ended Aug. 7 as 366,840 net tons, a decrease over the previous week of 10,570 tons. It is probable that the output will be still further reduced unless the demand soon shows betterment.

Old Material.—It is still a dealers' market, but there was not the activity the past week that featured the market the previous week. Some dealers believe prices were advancing too fast, and perhaps may be due for a slight reaction. It is stated that small sales of selected high grade steel scrap have been made at $15, delivered, but none of the large steel companies has paid over $14.50, and on most of the scrap bought recently not over $14. Within the past day or two, large quantities of selected heavy steel scrap have been offered to the leading consumers in this district at $14.50, and even as low as $14.25, and turned down. Prices on turnings, low phosphorus melting scrap, rerolling rails and bundled sheet scrap are higher. We note sales of 2000 tons of low phosphorus melting stock at $17.25 to $17.50; 1500 tons at $17.50; 1000 tons of heavy steel scrap at $14.50; 3000 tons at $14.10, and 1000 tons of bundled sheet scrap at about $12, delivered. Dealers quote, for delivery in the Pittsburgh and nearby districts that take the same rates of freight, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$14.00 to $14.50
Compressed side and end sheet scrap	13.00 to 13.25
No. 1 foundry cast	13.00 to 13.25
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	11.75 to 12.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	14.25 to 14.50
No. 1 railroad malleable stock	12.25 to 12.50
Railroad grate bars	8.75 to 9.00
Low phosphorus melting stock	17.25 to 17.50
Iron car axles	18.75 to 19.25
Steel car axles	16.00 to 16.50
Locomotive axles, steel	19.75 to 20.25
No. 1 busheling scrap	11.75 to 12.00
No. 2 busheling scrap	8.75 to 9.00
Machine shop turnings	8.75 to 9.00
Old carwheels	11.75 to 12.00
Cast-iron borings	9.25 to 9.50
*Sheet bar crop ends	13.50 to 14.00
Old iron rails	12.75 to 13.00
No. 1 railroad wrought scrap	13.00 to 13.25
Heavy steel axle turnings	9.00 to 9.25
Heavy breakable cast scrap	12.00 to 12.25

*Shipping point.

Chicago

CHICAGO, ILL., Aug. 18, 1915.—*(By Wire.)*

The prospect of rolling Bessemer rails for Russia at the rate of about 1000 tons a day through the remainder of the year fortifies the Western mill situation at the only point of weakness. Similarly Russian orders for spikes have absorbed what little manufacturing capacity remained for this product. The closing of the Western Indiana's track elevation tonnage relieves to an extent the dearth of work in Chicago fabricating plants and will doubtless accelerate the improvement in fabricated steel prices which was already under way in outlying districts. For plain structural material the leading interest is now asking 1.35c., Pittsburgh, which price applies as well to bars and plates. With respect to shapes and bars that price will not long be open to question, but plates are easily placed at 1.25c., Pittsburgh. In these heavier products new business has fallen behind specifications in point of tonnage, but seldom has inquiry been so generally representative of demand from machine and forge shops of every description. Galvanized sheet prices are following the downward trend of spelter, with business noticeably contracted. Bar iron is reasonably firm, at 1.25c., Chicago, while for hard steel as high as 1.35c. has been secured. The rolling of steel bars from billets by bar-iron and hard steel-bar mills is an interesting development. The scrap market presents an attractive field for the speculator, and steel scrap prices continue to mount. A brisk inquiry for foundry iron and sales of charcoal iron, 5000 tons of malleable and 8000 tons

of Northern basic are the features of the pig-iron market.

Pig Iron.—While manifesting such strength as has not been shown in at least two years, pig iron is still somewhat less advanced than other commodities and higher prices are accordingly a reasonable expectation. Local irons are very positively on the basis of $13.50 at furnace for this year, with a premium of 50c. per ton for first half delivery, and Southern iron, except for a very limited quantity of resale iron, is being held at a minimum of $11 for No. 2 at Birmingham, with the Tennessee Company asking $12.50, the Sloss Company $11.25. With Woodward and Napier furnaces practically out of the market, the firmness of prices from the South cannot be questioned. The selling of charcoal iron at Chicago, which was one of the particular activities of the week, has very materially strengthened that market and an advance of 50c. per ton for last half delivery and $1 per ton for shipments in the first half is announced. Inquiry and sales of foundry iron, while not in unusually heavy tonnages, were also numerous. Large orders of the week included 5000 tons each of basic and malleable together with the closing of 3000 tons of Northern basic by a St. Louis interest. The Iroquois Iron Company will blow in its second stack early in September and the Wisconsin Steel Company plans to have another of its stacks in blast by Sept. 1. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace, and do not include a switching charge averaging 50c. a ton.

Lake Superior charcoal, Nos. 2 to 5	$16.25 to $16.75
Lake Superior charcoal, No. 1	16.75
Lake Superior charcoal, No. 6 and Scotch	17.25
Northern coke foundry, No. 1	$14.00 to 14.50
Northern coke foundry, No. 2	13.50 to 14.00
Northern coke foundry, No. 3	13.25 to 13.50
Southern coke, No. 1 f'dry and 1 soft	15.50 to 16.00
Southern coke, No. 2 f'dry and 2 soft	15.00 to 15.50
Malleable Bessemer	13.50 to 14.00
Standard Bessemer	17.25
Basic	13.25 to 13.75
Low phosphorus	20.00 to 20.50
Silvery, 8 per cent	18.50 to 18.75
Silvery, 10 per cent	19.00 to 19.25

(By Mail)

Rails and Track Supplies.—Rails continue to be the conspicuous item among the list of steel products for which there is practically no home demand. The rolling of Bessemer rails at Chicago for Russia, however, now seems assured in sufficient tonnage to keep the South Chicago mill engaged during the remainder of the year at least. Orders for spikes from the same government have already been taken in proportionate quantities. Local manufacturing capacity for spikes, track bolts and angle bars is now fully taken. We quote standard railroad spikes at 1.60c. to 1.65c., base; track bolts with square nuts, 2c. to 2.10c., base, all in carload lots, Chicago; tie plates, $26, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base, open-hearth, 1.34c.; light rails, 25 to 45 lb., 1.07c.; 16 to 20 lb., 1.12c.; 12 lb., 1.17c.; 8 lb., 1.22c.; angle bars, 1.50c., Chicago.

Structural Material.—The important lettings of the past week included the placing of 3500 tons for the Chicago & Western Indiana railroad track elevation work at Chicago with the Morava Construction Company, and the formal awarding of 1250 tons for the First National Bank, Omaha, to the Omaha Structural Steel Company. The American Bridge Company will furnish 309 tons for the Chicago Surface Lines, 167 tons for the Chicago Great Western Railroad, 129 tons for the Minnesota Steel Company, and 419 tons for the Denver Union Terminal Company. A small tonnage for the Presbyterian Hospital addition was taken by the Hansell-Elcock Company and 386 tons for a building at Milwaukee went to the Wagner Architectural Iron Works of that city. Specifications for car steel constitute a large portion of current mill orders, but new buying of cars is limited to small miscellaneous lots with the exception of 500 awarded to the Haskell & Barker Car Mfg. Company by the New York Central Lines. Announcement is made to-day by the leading interest of an advance in the price of structural steel to the basis of 1.35c., Pittsburgh. The condition in which most of the structural mills find themselves warrants the assumption that this price will rapidly become general. We quote for Chicago delivery from mill 1.489c., to 1.539c.

The ordering of steel out of stock is much more brisk and reflects the increasingly tardy deliveries from mill. We quote for Chicago delivery out of store 1.80c.

Plates.—New business is generally light, but specifications are keeping the mills in practically full operation. Orders for plates are still being taken on the basis of 1.25c., Pittsburgh, and this price now seems to be the inside figure, though the advance to 1.35c. is made applicable to plates by some interests. We quote for Chicago delivery of plates from mill 1.439c. to 1.539c.

We quote for Chicago delivery of plates out of stock 1.80c.

Sheets.—Prices for galvanized sheets have followed the downward course of spelter and 3.75c., Pittsburgh, has been done in this market for the heavier gages. In one-pass sheets business is very limited. We quote for Chicago delivery from mill, No. 10 blue annealed, 1.539c. to 1.589c.; No. 28 black, 1.989c. to 2.039c.; No. 28 galvanized, 4.139c. to 4.389c.

We quote for Chicago delivery from jobbers' stock as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.55c.; No. 28 galvanized, 4.70c.

Bars.—An interesting development in connection with the rolling of shrapnel bars is the undertaking of such contracts by some of the bar-iron mills whose purchases of rerolling billets for that purpose include some shipments from the mill at the Soo. It is understood that about $22, Chicago, is being paid for rerolling billets. The Republic Iron & Steel Company is preparing to place a 10-in. mill in operation at its Moline plant, where high-carbon steel is rolled. Forging billets have jumped in price to $28 and $30. Hard-steel bar prices are firmer, and quotations range from 1.25c. to 1.35c. for prompt delivery. The market for bar iron is now quite generally on the basis of 1.25c., with tonnage somewhat improved, recent railroad orders being noted for an aggregate of about 3000 tons. We quote for mill shipment as follows: Bar iron, 1.25c.; soft steel bars, 1.539c.; hard steel bars, 1.25c. to 1.35c.; shafting, in carloads, 65 per cent off; less than carloads, 60 per cent off.

We quote store prices for Chicago delivery: Soft steel bars, 1.70c.; bar iron, 1.70c.; reinforcing bars, 1.70c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 55 per cent off.

Rivets and Bolts.—New prices have recently been announced by some manufacturers of bolts and nuts which represent an advance of from 5 to 10 per cent, but business in this market does not suggest as yet a revision of the following quotations: Carriage bolts up to ⅜ x 6 in., rolled thread, 80-10; cut thread, 80-5; larger sizes, 75-15; machine bolts up to ⅝ x 4 in., rolled thread, with hot pressed square nuts, 80-15; cut thread, 80-10; larger sizes, 80; gimlet point coach screws, 85; hot pressed nuts, square, $6 off per cwt.; hexagon, $7 off per cwt. Structural rivets, ¾ to 1¼ in., 1.75c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 1.95c.; boiler rivets, 2.05c.; machine bolts up to ⅝ x 4 in., 75-15; larger sizes, 70-10-10; carriage bolts up to ⅝ x 6 in., 75-10; larger sizes, 70-15 off; hot pressed nuts, square, $6, and hexagon, $6.70 off per cwt.

Wire Products.—The business in almost every department of wire making appears to be ample warrant for the increasing firmness in the market. The demand for bedspring wire has been exceptionally heavy and special wire is in equally good demand. Wire-nail sales are also reported in larger volume. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, $1.589; wire nails, $1.739 to $1.789; painted barb wire, $1.889; galvanized barb wire, $2.689; polished staples, $1.889; galvanized staples, $2.689, all Chicago.

Cast-Iron Pipe.—Municipal lettings now up for figures include 600 tons at Lincoln, Neb., 450 tons at Chariton, Iowa, and 800 tons at Maumee, Ohio. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $26; 6 to 12 in., $24; 16 in. and up, $23.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—Steel scrap continues the controlling factor in the old material market, and the influence of the premium on these grades is creating, for the users of other materials, a scale of prices out of keeping with their operating conditions and the market for their products. This is particularly true of No. 2 busheling, for which as high as $9.25 has been paid. An interesting purchase of steel car axles is noted, the axles to be used as low-phosphorus steel for melting in an electric furnace. Sales of axles have been made as high as $14. For rolling-mill scrap the normal demand is very moderate, the only inquiry of importance being for busheling. The principal listing of railroad scrap last week was that of the Northern Pacific, covering about 4500 tons, in which were included 1000 iron axles and about 1200 steel axles. We have revised our prices and quote for delivery at buyer's works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$12.25 to $12.50
Relaying rails	19.50 to 20.50
Old carwheels	11.75 to 12.00
Old steel rails, rerolling	12.50 to 13.00
Old steel rails, less than 3 ft.	12.25 to 12.75
Heavy melting steel scrap	11.75 to 12.00
Frogs, switches and guards, cut apart	11.75 to 12.00
Shoveling steel	11.50 to 11.75
Steel axle turnings	8.50 to 8.75

Per Net Ton

Iron angles and splice bars	$13.00 to $13.50
Iron arch bars and transoms	13.50 to 14.00
Steel angle bars	10.25 to 10.50
Iron car axles	15.00 to 15.50
Steel car axles	13.50 to 14.00
No. 1 railroad wrought	10.50 to 10.75
No. 2 railroad wrought	10.50 to 10.75
Cut forge	10.50 to 10.75
No. 1 busheling	9.25 to 9.50
No. 2 busheling	8.75 to 9.25
Pipes and flues	7.75 to 8.25
Steel knuckles and couplers	10.75 to 11.25
Steel springs	10.75 to 11.25
No. 1 boilers, cut to sheets and rings	8.25 to 8.50
Boiler punchings	10.00 to 10.50
Locomotive tires, smooth	9.75 to 10.00
Machine shop turnings	6.25 to 6.75
Cast borings	5.75 to 6.25
No. 1 cast scrap	9.50 to 10.00
Stove plate and light cast scrap	8.75 to 9.00
Grate bars	8.50 to 8.75
Railroad malleable	10.00 to 10.50
Agricultural malleable	8.75 to 9.00

Philadelphia

PHILADELPHIA, PA., Aug. 17, 1915.

The quotations for semi-finished and finished steel continue strong and in some instances have been advanced. Two eastern Pennsylvania plate makers are now quoting 1.509c., Philadelphia, or 1.35c., Pittsburgh. Some sellers of bars and miscellaneous steel products have practically withdrawn from the market. None is disposed to sell far ahead at present quotations, for still fresh in their memories is the recent dull period when sales were made at prices below mill cost to keep the wheels turning. Some large rail orders from Russia are in the air. Billets are scarce, and prices vary to a considerable extent. Sheets are active. The sold-up condition of Eastern structural mills is without change. Pig iron is more active, and prices have advanced or are on the point of advancing. Several thousand tons of standard low phosphorus brought over $22.50. Some business has been done into next year, but the makers insist that they do not wish to go beyond the fourth quarter. The ferroalloy situation is as uncertain as ever, and consumers continue to show anxiety. Old material is higher in a market which is steadily active.

Pig Iron.—Again the market is ruled by the sellers and they are more buoyant in spirit than they have been in many a day. Prices are higher and subject to prompt acceptance. Good-sized sales have been made, with the majority of the transactions involving from 300 to 600 tons. There is considerable inquiry for delivery next year and some business has been done, but most of the producers protest that they are not anxious to look into 1916. New England consumers seem especially desirous of making first quarter contracts, probably because of confidence inspired by the general activity in that section. To the 35,000 tons of basic iron which was purchased a week ago may be added 4000 tons, taken by a plate mill. The latter purchase was for November and December delivery, and the full price was paid. Basic is now firmly held at $15.50, delivered. Standard low phosphorus producers are satisfied in view of their being well sold up. Several thousand tons were sold this week at a figure over $22.50, delivered, and the price range is now $22.50 to $23. Makers of Lebanon low phosphorus are comfortably situated also, and it is proposed to quote $18 to $18.50, furnace. While the minimum quotation of some furnaces for eastern Pennsylvania No. 2 X is well over $15, delivered, quotations range from that figure to $15.50. One furnace representative has quoted $14.75, furnace, and made sales taking a freight rate of 79c., making the delivered price $15.54. A Virginia furnace, which is reported to be well sold up on No. 2 X, has advanced its quotations for delivery in the last quarter to $13.50 at furnace, or $16.25, delivered, for No. 2 X; $12.50, furnace, for No. 2, plain, and $12.25 for No. 3 foundry. Its quotations at furnace for the first quarter are $13.50 for No. 2 X, $13 for No. 2 plain, and $12.75 for No. 3 foundry, all of which take a freight rate of $2.75. The unusual differential between No. 2 X and No. 2 plain for last quarter will be noted. Another Virginia furnace has not advanced its price from $15.25 for No. 2 X. In the past week it has sold 4500 tons, and this month, about 9500 tons, mostly for delivery this year. Business running into next year has been declined by this furnace. One firm booked orders for 14,000 tons of miscellaneous irons in the week, and for 26,000 to 27,000 tons in the last two weeks, while another seller did better. The Pennsylvania Railroad was scheduled to close yesterday against its last-quarter requirements of 4000 tons. On Saturday 4500 tons of pipe iron was taken by a local shop with the understanding that 1000 tons was to be delivered at once. The sale was made at the full price. The quotation for No. 2 Southern iron is $11, Birmingham, but no local sales are reported. Here, also, a good part of the inquiry is for next year. Quotations for standard brands, delivered in buyers' yards, shipment ranging from third quarter to last half, range about as follows:

Eastern Penna., No. 2 X foundry	$15.00 to $15.50
Eastern Penna., No. 2 plain	14.75 to 15.25
Virginia, No. 2 X foundry	15.25 to 15.75
Virginia, No. 2 plain	15.00 to 15.25
Gray forge	14.50 to 14.75
Basic	15.50
Standard low phosphorous	22.50 to 23.00

Iron Ore.—The only interest shown is in domestic ores, which are relatively cheap as compared with foreign ores. Eastern furnaces have taken small lots of New York State ore. In the week ended Aug. 14, arrivals at this port totaled 10,267 tons from Sweden and 4700 tons from Cuba.

Ferroalloys.—The quotation for English 80 per cent ferromanganese is $100, seaboard, with arrivals as uncertain as ever. Some foreign producers are understood to have obtained licenses to ship this month, while others have not. Consumers are eagerly inquiring as to the arrivals. Domestic ferromanganese is reported to have sold at $135, furnace. The price range of 50 per cent ferrosilicon continues at $73 to $75, Pittsburgh.

Rails.—It is assured that the Cambria and Pennsylvania steel companies will roll a large quantity of rails for Russia, stated to total 100,000 tons, but there appears to be some uncertainty as to the final distribution. Gaston, Williams & Wigmore, New York, are handling the business. No other new business is reported by local mills.

Bars.—The quotation for ordinary steel bars is 1.459c., Philadelphia, but the situation is complicated by the withdrawal of some of the mills. They are too well filled up to participate in new business. Meanwhile specifications are being freely filed. A local producer of iron bars is quoting 1.459c., Philadelphia, and finds business from miscellaneous sources to be good.

Plates.—A leading maker has advanced his quotation to 1.509c., Philadelphia, on prompt delivery, and to 1.609c. for the last quarter. Deliveries continue to

the mooted point, and sellers say that consumers are spoiled in the recent dull spell when they had but to give the word and deliveries were quickly made. Today they must wait and they become very impatient. Scrap-plate business continues to develop and in one or two instances some of it has been declined. One maker is only considering spot business, and that at 1.509c., Philadelphia.

Structural Material.—The steady buying of small bridges by the Pennsylvania Railroad is a subject of comment, it being pointed out that these foot up a good total each month. The same railroad will take bids Aug. 23 on a pier shed at Greenville, N. J., calling for 2500 tons. The quotation is unchanged at 1.459c., Philadelphia, though small lots bring 1.509c. The mills are full.

Sheets.—The market is active and the quotation for No. 10 blue annealed sheets is firm at 1.659c., Philadelphia.

Billets.—The local mills have few or none to sell, and quotations for open-hearth rolling billets are strong at $30 to $33.50, Philadelphia. Forging steel $4 or more higher.

Coke.—Furnace coke is strong and tending toward greater activity. In foundry coke there is not much doing, but the market is sentimentally stronger, with the better demand for pig iron. Prompt furnace is quoted at $1.50 to $1.60 and contract at $1.85 to $2 per net ton at oven. Prompt foundry is about $2.50 and contract $2.60. Freight rates from the principal producing districts follow: Connellsville, $2.05; Latrobe, $1.85, and Mountain, $1.65.

Old Material.—The market continues to grow in strength and activity. The mills are buying steadily rather than in large individual quantities. Quotations for delivery in buyers' yards in this district, covering Eastern Pennsylvania and taking freight rates from 90c. to $1.35 per gross ton, are as follows:

No. 1 heavy smelting steel	$14.00 to $14.50
Old steel rails, rerolling	14.50 to 15.00
Low phos. heavy melting steel scrap	16.50 to 17.00
Old steel axles	18.00 to 19.00
Old iron axles	21.00 to 22.00
Old iron rails	16.00 to 16.50
Old carwheels	13.50 to 14.00
No. 1 railroad wrought	15.00 to 15.50
Wrought-iron pipe	13.00 to 13.50
No. 1 forge fire	10.00 to 10.50
Bundled sheets	10.00 to 10.50
No. 2 busheling	9.00 to 9.50
Machine shop turnings	10.00 to 10.50
Cast borings	10.00 to 10.50
No. 1 cast	13.50 to 14.00
Grate bars, railroad	10.50 to 11.00
Stove plate	10.50 to 11.00
Railroad malleable	10.50 to 11.00

Cincinnati

CINCINNATI, OHIO, Aug. 18, 1915.—*(By Wire.)*

Pig Iron.—The present market situation is peculiar. The only quotation out on Southern No. 2 foundry iron for shipment in the first quarter of next year is $12.50, Birmingham basis. This is out of line with the general price of $11.50 for the last quarter of this year, which is named by leading producers. Several contracts for shipment the remainder of the year have been made on a basis of $11, Birmingham, local and nearby foundries deciding to stock their iron in preference to taking chances on the future. A sale of 1000 tons is reported as being made to a local melter, and two other users took approximately 500 tons each. Several smaller sales were made this week, most of which were above the minimum price named. For the first time in years Virginia foundry iron has been sold in this territory in any quantity. A nearby melter bought last week, for last quarter shipment, approximately 2500 tons of No. 2 Virginia iron at about 25c. per ton under Northern iron quotations. Competition from the same producing center is also calculated to interfere in some territory now supplied by Southern producers. Northern foundry and basic are firm at $14, Ironton, for any shipment this year, but both foundry and malleable can be secured on contract for delivery through the first quarter at the same price. An inquiry for 1000 tons of malleable has been issued by a manufacturer in Chicago territory. The silvery irons are very active, and numerous small sales are reported. Quotations by nearly every producer have been advanced to $16.50, furnace, for this year's shipment and $17 for the first half of next year, although firm offers at $16 for prompt shipment have been accepted lately. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	$14.40 to $14.90
Southern coke, No. 2 f'dry and 2 soft	13.90 to 14.40
Southern coke, No. 3 foundry	13.40 to 13.90
Southern No. 4 foundry	12.90 to 13.40
Southern gray forge	12.40 to 12.90
Ohio silvery, 8 per cent silicon	17.26 to 17.51
Southern Ohio coke, No. 1	16.26 to 16.51
Southern Ohio coke, No. 2	15.26 to 15.51
Southern Ohio coke, No. 3	15.01 to 15.26
Southern Ohio malleable Bessemer	15.26 to 15.51
Basic, Northern	15.26 to 15.51
Lake Superior charcoal	16.20 to 17.20
Standard Southern carwheel	26.90 to 27.40

(By Mail)

Finished Material.—Owing to the easing in spelter prices, galvanized sheets continue to decline, and the present prompt shipment quotation of mills in this vicinity is on a basis of 3.75c., Pittsburgh, for No. 28 gage. No. 28 black sheets are quoted around 1.85c. to 1.90c., Pittsburgh. The local warehouse price on No. 28 galvanized sheets is unchanged at 4.50c., Cincinnati. Store quotations on steel bars from stock range from 1.80c. to 1.90c. and on structural shapes, cut to lengths when desired, from 1.90c. to 2c. Some improvement is noted in the demand for both steel bars and small structural shapes, although there is no big business in sight in the structural line. Steel rounds, or shrapnel bars, are in demand, but no Cincinnati firms have out any inquiries for this class of material. Quite a number of medium sized orders have lately been placed by the railroads for spikes and other track material.

Coke.—Several furnaces are out for a first half supply, but oven operators are not willing to quote prices beyond Jan. 1. While the general demand for spot coke is on the increase, prompt shipment furnace coke in the Connellsville district can be obtained at $1.50 to $1.60 per net ton at oven. Contract figures for last quarter shipment range from $1.70 to $2. Connellsville foundry coke for nearby shipment is quoted at $2.15 to $2.25 per net ton at oven, and as high as $2.65 for last quarter delivery. The foundries are only buying to fill immediate requirements, but so many of the jobbing foundries are consuming more than is due them on old contracts that carload orders for filling in are quite frequent from this source. Both Pocahontas and Wise County furnace and foundry cokes are held at a slightly higher level than prices quoted above.

Old Material.—The steel mills are taking large quantities of scrap, and the jobbing foundries are also consuming a proportionately big tonnage of No. 1 machinery cast. The railroad offerings are not quite as large as they were thirty days ago. The market is very firm, and small advances have been scheduled on practically all grades. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio, and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards.

Per Gross Ton

Bundled sheet scrap	$8.25 to $8.75
Old iron rails	11.50 to 12.00
Relaying rails, 50 lb. and up	20.25 to 20.75
Rerolling steel rails	10.00 to 10.50
Heavy melting steel scrap	10.00 to 10.50
Steel rails for melting	10.00 to 10.50

Per Net Ton

No. 1 railroad wrought	$9.50 to $10.00
Cast borings	6.00 to 6.50
Steel turnings	5.75 to 6.25
Railroad cast scrap	10.25 to 10.75
No. 1 machinery cast scrap	11.50 to 12.00
Burnt scrap	7.50 to 8.00
Old iron axles	14.50 to 15.00
Locomotive tires (smooth inside)	9.50 to 10.00
Pipes and flues	7.00 to 7.50
Malleable and steel scrap	8.25 to 8.75
Railroad tank and sheet scrap	6.25 to 6.75

The Clay Engine Company, Cleveland, Ohio, has equipped a Thew automatic shovel with one of its 30 to 35-hp. gasoline engines, making it a self-contained unit from the power and propelling standpoint. The engine is of the two-cylinder heavy duty type.

Buffalo

BUFFALO, N. Y., Aug. 17, 1915.

Pig Iron.—Unsolicited orders are being received by makers in large volume. The business booked the past week aggregates 40,000 to 50,000 tons, covering all grades. The larger proportion of this total covers orders received the past twenty-four hours. This situation has resulted in the further stiffening of prices, quotations now being made for last quarter delivery have been advanced to a minimum of $14 for any grade, with a maximum of $15 for the higher silicon grades and basic. The higher prices now being quoted by furnaces apparently do not check buying, as users even increase their orders over the quantities on which quotations had been asked. Iron on contract is being ordered out in increasing volume, in some instances specifications calling for shipment within a period of less than a month covering quotas originally intended to care for requirements to the end of the year. This indicates marked increase in consumption over estimates made earlier in the season. Furnaces are now very largely sold up for their fourth quarter production. Owing to the increased demand for steel-making iron one or two furnace interests are disposed to reduce their production of foundry grades and increase the production of basic proportionately. We quote as follows, f.o.b. furnace, Buffalo, for fourth quarter delivery:

No. 1 foundry	$14.50 to $15.00
No. 2 X foundry	14.25 to 14.50
No. 2 plain	14.00 to 14.25
No. 3 foundry	14.00
Gray forge	14.00
Malleable	14.25 to 14.50
Basic	14.50 to 15.00
Charcoal (regular brands and analysis)	16.75 to 18.25
Charcoal (special brands and analysis)	20.00 to 21.00

Finished Iron and Steel.—The leading interest announces that its price for steel bars, shapes and plates has been advanced to 1.35c., Pittsburgh, effective Aug. 16, for immediate specification, and that books are not being opened for fourth quarter business on structural shapes at this price. Full quotas are being specified on contracts, and in many instances contracts made some time ago to cover estimated requirements up to Dec. 31 have already been specified complete, and customers are coming into the market for new requirements at the present advanced prices. The demand for export material—plates and shapes as well as bars—is very heavy, and sellers are in some instances asking and obtaining $1 per ton advance over their domestic quotations. One strong feature of the market is the heavy demand for cold-finished steel, caused in part by the large increase in the output of automobile makers and by its use in connection with the manufacture of war materials. In addition there is an unusually large demand from jobbers for this commodity. An advance of $1 to $2 per ton in wire products is expected in the near future, which will include wire nails and bright wire. This advance in bright wire will offset the decrease in the price of spelter. Bids are being taken this week for 300 tons of fabricated steel required for the Sun Motor Car Company's new factory, Buffalo. The Progressive Structural Steel Company, Buffalo, has the contract for 300 tons of steel for the infants' home and mortuary building for the Church of Our Lady of Liberty, South Buffalo. The Riter-Conley Mfg. Company, Pittsburgh, has the contract for steel for the new foundry building for the Erie Malleable Iron Company, Erie, Pa., 800 tons, and the Ferguson Steel & Iron Company, Buffalo, for 100 tons for the Auditorium Building, Lockport, N. Y.

Old Material.—Increased demand for heavy melting steel has advanced the price 75c. per ton. The bulk of the tonnage of this commodity sold went to Pittsburgh and Valley points. Old steel axles have also advanced $1 per ton, orders which were chiefly for export having taken practically the entire stock accumulated in this market. Iron axles have advanced 50c. per ton. The demand for old carwheels, railroad malleable and cast scrap was light the early part of the week, but a more active inquiry has developed in the last day or two. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$12.25 to $12.50
Low phosphorus steel	15.00 to 15.50
No. 1 railroad wrought scrap	11.50 to 12.00
No. 1 railroad and machinery cast	11.00 to 11.50
Old steel axles	15.25 to 15.75
Old iron axles	17.00 to 17.50
Old carwheels	12.00 to 12.50
Railroad malleable	11.00 to 11.50
Machine shop turnings	6.25 to 6.50
Heavy axle turnings	8.50 to 9.00
Clean cast borings	7.00 to 7.25
Old iron rails	11.50 to 12.00
Locomotive grate bars	9.00 to 9.50
Stove plate (net ton)	8.25 to 8.75
Wrought pipe	8.50 to 9.00
Bundled sheet scrap	8.25 to 8.75
No. 1 busheling scrap	9.00 to 9.50
No. 2 busheling scrap	7.50 to 8.00
Bundled tin scrap	9.00

Cleveland

CLEVELAND, OHIO, Aug. 17, 1915.

Iron Ore.—Considerably more activity in the Lake Superior iron ore market has developed here. Within a few days several lots of 200,000 to 250,000 tons each have been placed and it is estimated that within the next few days fully 1,500,000 tons of additional ore will have been sold. At the same time no further activity in lake vessel circles is noted, since the ore shippers themselves are taking care of their own fleets first. It is believed that further vessel activity will not be marked until early next week but the season may end with considerable of a rush. We quote prices as follows, delivered to lower lake ports: Old Range Bessemer, $3.75; Mesaba Bessemer, $3.45; Old Range non-Bessemer, $3; Mesaba non-Bessemer, $2.80.

Pig Iron.—Cleveland blast furnace interests on Saturday advanced prices on foundry and malleable grades 50 cents a ton for the second time within a week. This new advance brings all grades of foundry, malleable and basic pig iron to $14.50, Cleveland furnace, for delivery over the remainder of this year. These interests also are asking $15, Cleveland furnace, for delivery on all three grades of iron after Jan. 1. Sales in scattered lots are being made at the advanced price and foundries are taking shipments so fast that little, if any, iron is being piled at furnaces. A sale of 500 tons of Southern iron at $11, Birmingham, for prompt delivery has been made and several like tonnages of Southern iron are involved in pending inquiry. M. A. Hanna & Co. are repairing their Claire stack at Sharpsville, Pa., and may blow in some time in October. Alice stack of the Valley Mold & Iron Company, Sharpsville, is to be relighted shortly, according to official announcement. Pickands, Mather & Co. have relighted their second stack at Toledo and repairs are being made to both Middlesex, Pa., furnaces of this interest and of M. A. Hanna & Co. A sale of 1000 tons of Bessemer iron by a Valley furnace has been made at $15.50, furnace, for third quarter delivery into the Pittsburgh district, but the general asking price for Bessemer in the Valley seems to be $15.25, furnace, for this year's delivery. The John F. Casey Company, Pittsburgh, on Monday broke ground at Canton, Ohio, for the proposed blast furnace being built by Pickands, Mather & Co., and the United Steel Company of Canton.

Coke.—Furnace fuel, while not immediately in active demand in this district, is expected to become more of a market factor because of the proposed relighting of several stacks in outlying territory. Prompt furnace coke is quoted at $1.50, per net ton at ovens, as a minimum, and this has resulted in some tentative negotiations. The general quotation on Connellsville prompt furnace coke is $1.50 to $1.60 and the contract quotation is $1.75 to $1.80, practically unchanged. Connellsville prompt foundry coke, standard grades, is quoted at a range of $2.15 to $2.50 per net ton at ovens, and contract coke is held at $2.25 to $2.60 per net ton. Some small amounts of foundry coke for prompt delivery have been placed in the past week but none of importance.

Finished Steel.—The announcement of the advance of $1 a ton by the Carnegie Steel Company on Monday on plates, shapes and bars to 1.35c., Pittsburgh, while not unexpected, has not been followed here as yet by other steel makers. It is clear that plates can be had

in this immediate and in outlying territory at 1.25c., although some Eastern mills have been able to get 1.40c., Cleveland, for their higher grade boiler plate specialties. Since mills are fairly well fixed with specifications, which in some Cleveland sales offices bid fair to place August business in the record class, such an advance here is deemed not unlikely to gain adherents. The Valley Mold & Iron Company, Sharpsville, Pa., is figuring on 1000 tons of structural material for extensions to its foundry. The Timkin Roller Bearing Company, Canton, Ohio, which has been in the market for 15,000 tons of steel, has succeeded in placing 3500 tons of electric steel and 1000 tons of open-hearth steel, but still is in the market for 11,500 tons on its original inquiry. The Canton Sheet Steel Company is engaged in building six hot mills additional to its plant. For the deck of the Clark Avenue viaduct 500 tons of reinforcing bars have been placed with the Trussed Concrete Steel Company, Detroit.

Semi-Finished Steel.—While the open-hearth steel market in northern Ohio on both billets and sheet bars has not changed in quotations actively, yet the market is firmer if anything than in the past week. Some fair-sized tonnages of open-hearth sheet bars have been sold in northern Ohio at $25, Pittsburgh, for delivery in August and September, and additional tonnages have been sold at $26, Pittsburgh, for delivery into last quarter of this year.

Old Material.—Practically all descriptions of iron and steel scrap are held at higher prices in this market, although no increase in volumes of purchases by mills is noted. Sellers expect higher prices in line with the advances in pig iron and finished steel so that the present market is largely sentimental. Some brokers have been squeezed by the recent unexpected advance in prices. Heavy melting steel now is quoted $11.75 to $12 per gross ton, Cleveland, and $12.50 to $13, Youngstown. While iron mills continue to buy cautiously, steel mills in this district are taking material in fair volume. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Old steel rails, rerolling	$11.75 to $12.75
Old iron rails (nominal)	13.00
Steel car axles	14.00
Heavy melting steel	11.75 to 12.00
Old carwheels	9.75 to 10.00
Relaying rails, 50 lb. and over	22.50
Agricultural malleable	9.50 to 10.00
Railroad malleable	10.75 to 11.25
Steel axle turnings	9.00 to 9.25
Light bundled sheet scrap (nominal)	9.50 to 10.00

Per Net Ton

Iron car axles (nominal)	$15.00 to $15.50
Cast borings	6.25 to 6.75
Iron and steel turnings and drillings	5.75 to 6.00
No. 1 busheling (nominal)	8.50 to 8.75
No. 1 railroad wrought	10.25 to 10.50
No. 1 cast	10.00 to 10.50
Railroad grate bars	8.00 to 8.50
Stove plate	8.50 to 8.75

Birmingham

BIRMINGHAM, ALA., Aug. 16, 1915.

Pig Iron.—The market appears to be safely intrenched on a basis of $11 for spot, with as high as $11.50 for carload lots, $11.25 for strictly fourth quarter on the part of one interest and the majority of sellers making no difference between spot and fourth quarter. The Tennessee Company continues to quote and sell 1916 iron at $12.50, the tonnage of bookings increasing at a respectable rate. A sale of 2000 tons was made to a Southern pipe company at $11, the quotation being an advance on business on which dickering for $10.50 on the part of the consumer delayed the transaction. A sale of 600 tons of No. 1 at $11.50 and 300 tons of No. 2 at $11 for the rest of the year was made to the same party. One large producing interest, the one with the largest stocks, sold its make for the entire month, a matter of nearly 35,000 tons, by the 12th and is resting on its oars at the level of $11 spot and $11.25 for fourth quarter. A firm offer of $11 for a fair tonnage for November delivery was declined. The leading interest, which has blown in an additional stack and now has three foundry furnaces on the active list with six on basic, has re-entered the foundry market to sell such an amount of metal as it may have under this operation. The Central Iron & Coal Company is practically out of the market, all its metal being taken care of by its own auxiliary pipe interests and elsewhere. The Woodward Iron Company is reported as taking care of regular customers at market prices. The Republic Iron & Steel Company is in line with the rest of the field. As a general proposition the maker is not seeking the customer. It is rather the other way. All are well taken care of and holding back for prospective rises. The Republic will blow in a stack within two to three weeks and the Tennessee another Bessemer stack by Sept. 1. Woodward has announced no date for blowing in at Vanderbilt on account of coke shortage, but it will be as early in September as possible. Reports of purchases of pig iron by the Tennessee Company are without foundation. It has plenty of idle furnaces yet to draw upon. Running at capacity in steel mills is still the report. We quote for spot and fourth quarter (carload lots as high as $11.50) as follows:

No. 1 foundry and soft	$11.50 to $11.75
No. 2 foundry and soft	11.00 to 11.25
No. 3 foundry	10.50 to 10.75
No. 4 foundry	10.25 to 10.50
Gray forge	10.00 to 10.25
Basic	No quotation
Charcoal	22.50 to 23.00

Cast-Iron Pipe.—Little new business has come out, but prices have stiffened as the result of the pig-iron advance. The Alabama output will be increased Sept. 1 by the entrance of the Bessemer plant of the United States Cast Iron Pipe & Foundry Company, on which extensive improvements have been about completed. Two pits will go on at that date. It is understood that the company's Birmingham plant will also resume if orders justify it. The active plants are well taken care of. The National is sold to capacity well ahead. The sanitary shops are on a maximum of 50 per cent of capacity and conditions are not reported as satisfactory. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., $21.50; 6-in. and upward, $19.50, with $1 added for gas pipe.

Coal and Coke.—Coke is stiff at advancing quotations. The Woodward Iron Company is resuming at its idle beehive ovens owing to pressing needs and non-completion of the by-product additions. The foundry trade is taking more coke every week, much by-product coke going that way as well as beehive. We quote, per net ton, f.o.b. ovens, as follows: Beehive furnace, $2.75 to $3; beehive foundry, $3.25 to $3.50; by-product, $2.50 to $2.75. Coal has felt a slight improvement. The Interstate Commerce Commission's allowance of a raise in rates to Mississippi River points from Alabama, Kentucky and Illinois coal mines does not alter the situation between the several points, but Alabama River operators believe it will stimulate the Warrior River business to New Orleans. The Alabama output is at 50 per cent of capacity.

Old Material.—Dealers report a brisk movement of heavy cast and stove plate, an increasing demand coming from the foundries. Prices are firm and the disposition to make further advances will be carried out if pig iron develops more strength. We quote, per gross ton, f.o.b. dealers' yards, as follows:

Old iron axles	$13.00 to $13.50
Old steel axles	12.50 to 13.00
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	8.00 to 8.50
No. 2 railroad wrought	7.50 to 8.00
No. 1 country wrought	8.00 to 8.50
No. 1 machinery cast	8.25 to 8.75
No. 1 steel scrap	8.50 to 9.00
Tram carwheels	8.25 to 8.75
Stove plate	7.25 to 7.75

A department of engineering, under the direction of the Railway Commission of Wisconsin, has been created by act of the 1915 Wisconsin Legislature. The head of the department is to be known as State chief engineer. He shall have supervision over all engineering or architectural work performed by or for the State or by or for any of the departments, boards or commissions of the State, or in the promotion of any engineering or architectural project undertaken by the State, including work in constructing, altering or rebuilding any building, power or electric plant, heating or pumping station.

St. Louis

ST. LOUIS, MO., Aug. 16, 1915.

Pig Iron.—Demand continues to increase, and some furnaces are out of the market for the immediate future. Practically no figures are obtainable on 1916 delivery. No representatives in this market are quoting lower than $11.50, Birmingham, for No. 2 for last quarter and in one case a considerable tonnage sought at that figure was turned down with the notation that considerably less than one-third the wanted amount would be sold as a favor at $11.75 for last quarter. Sales of the week included one of 2200 tons, one of 1500 tons, several of 500 tons and quite a number of 300 tons and less. The basic inquiry for 15,000 tons reported last week is understood to have been closed, making the second for that quantity. A considerable number of foundries are still out of the market pleading that they have not the business ahead to justify contracting.

Coke.—Sales have been for the most part of small lots. The local by-product coke still commands the situation and is expected to do so until the demand covers the output.

Finished Iron and Steel.—Fabricators report more inquiry than for a long time. Demand for bars is becoming heavy and a construction contract let in the week calls for delivery in the first quarter of about 1900 tons of piling and 500 tons of reinforcing bars. There is some increase from the coal interests for light rails, and the lumber interests are also taking better. Agricultural machinery interests are taking quite freely. The extension of delivery periods is causing pressure on the warehouses, and movement therefrom is good. The new price of 1.35c., Pittsburgh, for structural material, tank plates and bars is being well received, consumers being willing to pay the higher prices rather than contract ahead on the present order showing of their books. For stock out of warehouse we quote as follows: Soft steel bars, 1.75c.; iron bars, 1.70c.; structural material, 1.85c.; tank plates, 1.85c.; No. 10 blue annealed sheets, 2c.; No. 28 black sheets, cold rolled, one pass, 2.55c.; No. 28 galvanized sheets, black sheet gage, 4.60c.

Old Material.—The scrap situation is still much in the dealers' hands. While prices are higher, consumption has not increased sharply as yet. Steel scrap is the most active, with foundry grades least wanted. The rolling mills are doing a little buying and so are the steel mills, but chiefly to meet special requirements, general stocks in their yards being large. Rerolling rails are especially active. Lists out for the week include 200 tons from the Frisco, 1200 tons from the Missouri, Kansas & Texas, 4500 tons from the Northern Pacific. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton	
Old iron rails	$11.00 to $11.50
Old steel rails, rerolling	12.00 to 12.50
Old steel rails, less than 3 ft.	11.50 to 12.00
Relaying rails, standard section, subject to inspection	21.00 to 23.00
Old carwheels	10.50 to 11.00
No. 1 railroad heavy melting steel scrap	11.50 to 12.00
Shoveling steel	9.50 to 10.00
Frogs, switches and guards cut apart	11.00 to 11.25
Bundled sheet scrap	6.75 to 7.25
Per Net Ton	
Iron angle bars	$11.00 to $11.25
Steel angle bars	10.00 to 10.50
Iron car axles	15.75 to 16.25
Steel car axles	12.50 to 13.00
Wrought arch bars and transoms	12.75 to 13.25
No. 1 railroad wrought	10.00 to 10.25
No. 2 railroad wrought	9.25 to 9.75
Railroad springs	10.00 to 10.50
Steel couplers and knuckles	10.25 to 10.75
Locomotive tires, 42 in. and over, smooth inside	10.00 to 10.25
No. 1 dealers' forge	8.50 to 8.75
Mixed borings	6.50 to 7.00
No. 1 busheling	8.50 to 8.75
No. 1 boilers, cut to sheets and rings	7.00 to 7.25
No. 1 railroad cast scrap	9.50 to 10.00
Stove plate and light cast scrap	7.75 to 8.25
Railroad malleable	8.75 to 9.00
Agricultural malleable	7.75 to 8.00
Pipes and flues	7.00 to 7.50
Railroad sheet and tank scrap	7.00 to 7.25
Railroad grate bars	7.75 to 8.00
Machine shop turnings	7.25 to 7.75

San Francisco

SAN FRANCISCO, CAL., Aug. 10, 1915.

Aside from the gradual stiffening of prices, conditions show little improvement. Merchants have done practically nothing all summer, and approach the fall season with stocks in very good shape. Consequently, unless the next few months bring improvement beyond all expectations, buying will be limited to sorting-up orders. There is some activity in shipbuilding, but general building is quiet and there is little development work requiring much tonnage. Export business is growing. A good movement of rails, horseshoes, etc., is observed via Seattle to Siberia, and China and Japan are coming to this country for steel formerly taken from Germany and Belgium. This demand for bars is being partly met by Pacific coast mills; to what extent other materials will be handled through Pacific coast agencies is still uncertain.

Bars.—The volume of business, both domestic and foreign, shows a slight increase, but competition between mills of this district has prevented prices from advancing in keeping with Eastern conditions. The local price on steel bars is about 1.75c. at mill, while at some competitive points between here and Los Angeles sales have been made as low as 1.65c., carloads, for immediate shipment from the local warehouse of the United States Steel Products Company being held at 1.80c. While prices are apparently in favor of local mills, the latter are still somewhat handicapped in the matter of sizes and other points of service which are often of importance to the buyer, and Eastern interests are getting a fair share of the business.

Structural Material.—Dyer Bros. are low bidders on 2000 tons for the University of California. The figures showed less anxiety for business on the part of Eastern fabricators. Aside from this only a few insignificant contracts have been let, and there are practically no new inquiries. Shipbuilders are taking a fair tonnage of shapes, but fabricators are keeping their purchases down closely to work on hand.

Rails.—Small orders for mine rails are coming out fairly well for this time of year, but standard sections receive little attention. A substantial quantity, consisting largely of industrial track for plantation use, has been taken for the Hawaiian Islands.

Plates.—Business continues to come through on shipbuilding contracts, on which several plants at San Francisco, Long Beach and Seattle are well occupied, and other important contracts are expected. New tank orders are of minor importance, though the aggregate is fair and a good deal of material is coming through on old contracts. Distributive business is dull.

Sheets.—Several important mills are still refusing business in galvanized, and some have withdrawn from the market on blue annealed. There is not much demand here for either, as consuming industries are quiet and the larger buyers covered requirements pretty well at lower prices.

Wrought Pipe.—A number of good sized orders have recently been placed for water and gas works. Jobbing business, however, continues extremely dull. Merchants have good supplies, and preparations for the fall trade are limited to a few fill-in orders.

Cast-Iron Pipe.—Pasadena, Cal., will take figures Aug. 17 for about 400 tons of 4 to 12 in. pipe, and Santa Barbara will take bids Aug. 23 for 140 tons of 4 to 6 in. No other municipal inquiries have appeared, and corporation business is rather quiet. Prices are quoted at $29 for 6-in., $31 for 4-in., and $1 extra for gas pipe, per net ton, San Francisco.

Pig Iron.—There is still a fair tonnage of foreign iron in importers' hands, but with continued light arrivals foundry stocks are getting down to rather small dimensions, and spot prices show some stiffening. Chinese iron has lately been quoted as high as $24 to $25 per gross ton, for prompt delivery. Southern foundry iron shows a sharp advance, being quoted around $21.50 per gross ton, San Francisco.

Coke.—The coke situation has been eased a little by the arrival of a cargo of 1110 tons from England for

Balfour, Guthrie & Co. It is reported that another English cargo is due soon, and another later in the year, and that a cargo of German Syndicate coke is overdue from Rotterdam. Business is quiet. Foreign coke at the yards is quoted at $14 per net ton, and desirable grades of American coke, to arrive, at $14 to $15 per net ton.

Old Material.—The demand for cast scrap is light, owing to the limited scale of operations of local foundries at present. Small sales, however, are being made at $14 to $15 per net ton. The steel mills have been taking a little more interest in melting scrap, and prices have advanced to $7 to $9 per gross ton.

New York

NEW YORK, Aug. 18, 1915.

Pig Iron.—Not as much iron has been sold in this market in the past week as in the week preceding. There is no stampede and the references made here and there of late to the possibilities of a runaway market were at least premature. The announcement of higher prices by furnaces for forward deliveries is still a feature. In the past week central Pennsylvania furnaces which have sold No. 2 X at $13.25 at furnace have advanced their prices to $13.75 for this year's delivery, while for the first quarter of next year $14.25 is asked and for the first half $14.75. On this year's delivery this advance means about $15.90 at tidewater. The air brake company which was in the market has made some purchases and the buying of basic iron for Granite City, Ill., about 8500 tons, has been negotiated through New York, the iron coming from Chicago district furnaces. The General Electric Company has bought Buffalo iron for delivery at Lynn, Mass., and is in the market for more. Furnaces are not making particular efforts to sell for next year and on the other hand it is the exceptional foundry that is concerning itself much about iron for that delivery. Virginia iron is generally held at $13.50 at furnace for No. 2 X and some Virginia iron of special manganese content has sold at $14 at furnace. Eastern Pennsylvania furnaces are asking $14.50 to $15 at furnace for No. 2 X for the fourth quarter. We quote at tidewater as follows for third quarter delivery: No. 1 foundry, $15.75 to $16; No. 2 X, $15.25 to $15.50; No. 2, plain, $15 to $15.25; Southern iron, $15.75 to $16 for No. 1 and $15.25 to $15.50 for No. 2.

Ferroalloys.—A small amount of future business in ferromanganese is being put through, sales of 50, 100 and in one case 300 tons being reported, mainly at $100 at seaboard. All such sales are made contingent on ability of the British makers to forward the product. Within the past ten days several lots have arrived at Baltimore and Philadelphia, shipped under July licenses, the total of these being probably 5000 to 6000 tons. The accumulation of stocks in Great Britain under the government's recent order leaves little available for shipment in August and actual shipments this month from British ports have been small. One English maker has withdrawn from the market for the present. There is a disposition on the other side to take care especially of American users whose steel is being shipped to the Allies. The usual quotation in England for consumption there is £20. In ferrosilicon export shipments by a Canadian producer are a feature. Prices in England have advanced. We continue the quotation of $72 to $73, Pittsburgh, for 50 per cent.

Structural Material.—New demand is not heavy, few large projects are being closed in this territory, but small lot buying totals well and movement of plain material under contracts is heavy. The result is that mills can rarely offer prompt shipments on new business but require five to ten weeks, depending on the mill. Under these conditions and the strength of the general steel market, prices are firmer. Some advances of $1 per ton have been made, and it is expected that 1.35c., Pittsburgh, will shortly be ruling as the minimum. It is interesting that the July volume of contracting, as reported by the Bridge Builders and Structural Society, shows that the average rate for the last five months is a little higher than the average for the same months of 1914, those which immediately preceded the European war. Railroad inquiries for bridge material are still mainly of small lots, the New York Central, for example, taking figures for about 200 tons for some fourteen bridges, and the Boston & Maine for about 100 tons for more than one bridge, in addition to the 200 tons at Johnson, Vt. The Pennsylvania Railroad is in the market for a total approaching 2000 tons of bridge work, including 1400 tons in eastern Pennsylvania. The New York Dock Department is in the market for a piershed at Twenty-ninth Street, Brooklyn, involving 650 tons, and the Ward Line is to build a pier on the East River taking several hundred tons. Among the recent awards may be mentioned 1000 tons for Oppenheim, Collins & Co., Brooklyn, to Hay Foundry & Iron Works; 1800 tons for the Fullerton-Weaver apartment on Park Avenue, between Fifty-fifth and Fifty-sixth Streets, to Milliken Brothers, incorrectly given to another fabricator last week, and 400 tons for the Morrow Mfg. Company, Elmira, N. Y., reported awarded to the American Bridge Company. It is reported that the Pennsylvania Steel Company has secured the Central Railroad of New Jersey pier, North River, taking 900 tons. One of the latest apartment house projects on which bids are in is for 750 tons for the 930 Park Avenue Company, Inc. We quote mill shipments at 1.30c. to 1.35c., Pittsburgh, or 1.469c. to 1.519c., New York. For small lots from store we quote 1.95c. to 2c., New York.

Steel Plates.—A Pittsburgh basis of 1.35c. is now more generally ruling, certainly for the relatively small lots, of which local business is mainly constituted. Buyers, used to shipments in a few days after ordering, are finding themselves embarrassed by the inability of mills to furnish material with the accustomed promptness. Deliveries are made in about four weeks except of universal plates, which are obtainable in two to three weeks. It is doubtful if new business can be closed at 1.25c., Pittsburgh, and probably only at 1.30c. for a limited time. There does not appear to be any foundation for the rumors of French purchases of cars, nor has new domestic inquiry of moment resulted. For the Wells Fargo Company thirty-five refrigerator cars are being figured. The Atlantic Coast Line has closed for 800 box cars of thirty tons capacity. We quote 1.30c. to 1.35c., Pittsburgh, or 1.469c. to 1.519c., New York, for mill shipments. Plates from store are 1.95c. to 2c., New York.

Iron and Steel Bars.—Bar iron has taken another advance, and now is more generally quoted at a Pittsburgh basis of 1.30c. Coincident with this advance is an advance of $1 per ton on steel bars. This is so far for small lots, but points to a more general establishment of a 1.35c. base for steel bars generally. Specifications are heavy on steel bars and there are indications that buyers have underestimated their needs. Bar iron sellers are securing further steel bar business, where urgency of need has resulted in the substitution. We quote mill shipments of steel bars at 1.30c. to 1.35c., Pittsburgh, or 1.469c. to 1.519c., New York, and refined iron bars 1.419c. to 1.469c., New York. Out of store in New York iron and steel bars are 1.90c. to 1.95c.

Cast-Iron Pipe.—Interest centers on the large letting of pipe at Watervliet, N. Y., on which bids were opened on Monday. The United States Cast Iron Pipe & Foundry Company named the lowest price and will probably get the contract. The usual midsummer dullness prevails as to public lettings. Only a few are announced, usually for only small quantities. Dallas, Texas, is inquiring for 3500 tons, mostly 6-in. Private buying keeps up surprisingly well, considering the vacation season. Prices are very firmly held on moderate quantities, but, whenever an attractive order presents itself, competition again becomes keen. Carload lots of 6-in. class B and heavier, are quoted at $23.50 to $24 per net ton tidewater, class A and gas pipe taking an extra of $1 per ton.

Old Material.—Consumers are resisting the advance in prices, but their efforts appear to be vain. The market is apparently in full control of the dealers and, while the highest prices realized have so far resulted

from transactions among themselves, consumers invariably find that they are compelled to pay a higher level than when they were previously in the market. In some classes of old material the indications are strong that dealers have oversold and are now obliged to pay much higher prices to secure what they need to fill contracts. Brokers are paying about as follows to local dealers and producers, per gross ton, New York:

Old girder and T rails for melting	$11.50 to $12.00
Heavy melting steel scrap	11.50 to 12.00
Relaying rails	19.50 to 20.00
Rerolling rails	12.00 to 12.50
Iron car axles	18.50 to 19.00
Steel car axles	16.50 to 17.00
No. 1 railroad wrought	12.50 to 13.00
Wrought-iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	11.75 to 12.00
No. 1 yard wrought, short	11.50 to 12.00
Light iron	4.00 to 4.25
Cast borings	7.50 to 8.00
Wrought turnings	7.50 to 8.00
Wrought pipe	11.00 to 11.25

Cast scrap is in only moderate demand, but prices are higher in sympathy with pig iron. Dealers' quotations to consumers of cast scrap are as follows, per gross ton, New York:

Old carwheels	$11.50 to $12.00
No. 1 cast (machinery)	12.75 to 13.00
No. 2 cast (heavy)	11.75 to 12.00
Stove plate	9.50 to 9.75
Locomotive grate bars	8.50 to 8.75
Malleable cast (railroad)	9.25 to 9.50

British Iron Market Quiet

Semi-finished Steel Sold at High Price—Ferrosilicon Advancing.

(By Cable.)

LONDON, ENGLAND, Aug. 18, 1915.

Pig iron continues quiet with makers not inclined to force sales. The output is going fully into consumption. A sharp advance is expected when the Dardanelles is forced. There is still talk of more furnaces stopping. The hematite iron market is featureless, but some increased foreign demand is noted. Stocks of pig iron in Connal's Stores are 142,990 gross tons, against 142,217 tons a week ago.

There is very little doing in tin plates owing to American activity in neutral markets. Semi-finished steel is firm and 4 to 8 in. blooms have been sold at £7 10s. c.i.f. (which is equivalent to $34.91 with exchange at $4.65½).

Ferrosilicon is advancing and is now quoted at £16 10s. c.i.f. (or $76.81 with exchange at $4.65½.)

We quote as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 18s. 3d. against 18s. 6d. last week.

Cleveland pig-iron warrants, 64s. 9d., against 66s. 2d. last week.

No. 3 Cleveland pig iron, maker's price, f.o.b. Middlesbrough, 65s., against 66s. 3d. one week ago.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £11 15s.

Steel ship plates, Scotch, delivered local yards, £9 15s.

Steel rails, export, f.o.b. works port, £8 17s. 6d.

Hematite pig iron, f.o.b. Tees, 97s.

Sheet bars (Welsh), delivered at works in Swansea Valley, £7 10s.

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £10.

Steel bars, export, f.o.b. Clyde, £10 15s.

Ferromanganese, f.o.b., £20 15s.

Ferrosilicon, 50 per cent, c.i.f., £16 10s., against £15 5s. one week ago.

The New Milford Cold Rolled Steel Company, New Milford, Conn., has filed a petition in bankruptcy, showing liabilities of $38,242.05 and assets of less than $2,000. The petition, which followed a vote of the directors taken about two weeks ago, was accompanied by an affidavit from the president, Percy C. Farwell, that the corporation was unable to raise the $30 to pay the filing fee. A large proportion of the indebtedness is in New Milford.

The Automatic Transportation Company, Buffalo, N. Y., builder of storage battery industrial trucks, has a two-year contract, involving about $4,000,000, for machining 750,000 18-lb. high-explosive shells for the British Government.

Metal Market

NEW YORK, Aug. 18, 1915.

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
Aug.	Lake	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
11	20.00	17.50	35.00	4.50	4.37½	14.00	13.75
12	19.75	17.25	34.50	4.45	4.37½	13.50	13.25
13	19.75	17.25	34.37½	4.40	4.35	12.50	12.25
14	19.50	17.25	34.25	4.40	4.35	12.25	12.00
16	19.25	17.00	34.50	4.45	4.35	12.25	12.00
17	19.00	16.75	34.50	4.50	4.35	11.75	11.50

Copper is lower in a lifeless market. Tin is inactive and easier. Lead has a better tone because of foreign buying. Spelter is dull and lower. Antimony continues quiet.

New York

Copper.—The market has been steadily quiet and second hands are bringing considerable pressure to sell. Some are said to have made offerings of electrolytic down to 16.50c. cash, New York, and business certainly could be done at 16.75c. It is stated that producers would accept 17c. cash, New York, and perhaps a shade lower. The trade is in a state of expectancy looking for something to happen every day, but it has failed to come. The market for Lake is as flat and drifting as that for electrolytic. It can be had at 19c., although for prime brands 20c. is still asked. A good deal of the present inactivity is ascribed to the low rate of foreign exchange which yesterday was $4.65½ per pound sterling, with low rates for Continental moneys also. The exports of copper are making a poor showing this month, those to date amounting to 8963 tons.

Tin.—Since the last flurry of a few days ago the market has been very quiet. There has been a little buying of spot tin, but none worthy of comment in futures. Last week, and since, there was considerable pressure to sell but no buyers despite offerings at concessions. On the other hand, there has been some show of interest in large lots of futures, but this has not progressed to the point of actual inquiry. It indicates, however, that the present attractive prices are being considered. If inquiry and business results, it is not expected to be more than a passing flurry, similar to that of a few days ago. The New York quotation yesterday was 34.50c.

Spelter.—Carload lots of prime Western are quoted at 11.75c. to 12c., New York, but there is nothing doing. Consumers are staying out of the market, sellers are cutting prices, and it is probable that a firm offer of 10.50c. to 11c., New York, would be accepted for prompt delivery, and 9.50c. to 10c. for futures. Brass mill specials are quoted at 15c. All interested are now watching to see prompt delivery metal drop below 10c. Only a good export demand or a general understanding that prices have dropped low enough can stop the present downward tendency. It is unquestioned that the brass mills are covered for some months to come, so far as the munitions requirements go. It is on these, and these only, that they are working to capacity. An influence which is restraining some consumers is the talk of new smelters whose product is soon expected on the market. The exports this month total 2539 tons.

Antimony.—Good buying has been expected, but so far it has failed to materialize and the quotation for Chinese and Japanese is not strong at 34c.

Old Metals.—Prices are declining, and as usual under such conditions buyers are not in the market. It is difficult to arrive at a proper basis of prices. Dealers' selling quotations, which are purely nominal, are as follows:

	Cents per lb.
Copper, heavy and crucible	16.00 to 16.50
Copper, heavy and wire	15.50 to 16.00
Copper, light and bottoms	13.50 to 14.00
Brass, heavy	11.00 to 11.50
Brass, light	9.00 to 9.50
Heavy machine composition	13.00 to 13.50
No. 1 yellow rod brass turnings	12.50 to 13.00
No. 1 red brass or composition turnings	11.50 to 12.00
Lead, heavy	4.25
Lead, tea	4.00
Zinc, scrap	8.00

Lead.—The market was heavy last week and sagged to 4.40c., New York. On Monday, however, it responded to a better tone in London and confidence revived, the better feeling being helped along by inquiries and purchases here on the part of Russia. Fair sales took place on Monday, and to a lesser extent yesterday. The trade is not as pessimistic as it was, and it is now difficult to find lead at less than the price of the largest producing interest—4.50c., New York, and 4.35c., St. Louis. The exports total only 1358 tons for the month.

Chicago

AUG. 16.—The firming up in to-day's market comes after a full week of steadily declining prices. Throughout the week buying was very limited, and regular consumers are apparently satisfied with present supplies. We quote: Casting copper, 16.75c. to 17c.; Lake copper, 17.50c. to 17.75c.; tin, carloads, 35c.; small lots, 36c.; lead, 4.40c.; spelter, nominally, 12c.; sheet zinc, nominally, 21c.; Cookson's antimony, 47.50c. to 50c.; other grades, 37c. to 38c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 13.50c.; copper bottoms, 12.50c.; copper clips, 13.25c.; red brass, 11c.; yellow brass, 10c.; lead pipe, 3.75c.; zinc, 7c.; pewter, No. 1, 18c.; tinfoil, 25c.; block tin pipe, 27c.

St. Louis

AUG. 16.—The non-ferrous metals have continued to grow easier. Lead is quotable to-day at 4.30c.; spelter, 12c.; tin, 38c.; Lake copper, 18.50c.; electrolytic copper, 18c.; Cookson's antimony, 38c. In the Joplin ore district zinc blende dropped sharply, the basis range for 60 per cent being $60 to $85 per ton, with the top settlement at $88. Calamine was weaker at $45 to $50, with the choicest ores as high as $55. Lead ore was dull and unchanged at $50. Miscellaneous scrap metals are quoted as follows: Light brass, 7.05c.; heavy yellow brass, 9.50c.; heavy red brass and light copper, 11c.; heavy copper and copper wire, 13c.; pewter, 24c.; tinfoil, 30c.; zinc, 8c.; lead, 4c.; tea lead, 3.50c.

J. A. Massel, special agent for the United States Bureau of Foreign and Domestic Commerce, who recently returned from a tour of the South and Central American countries, was in Worcester, Mass., Aug. 11 and 12. While there he met a large number of manufacturers of machine tools and in an interview with a local reporter for the daily press stated that his trip, which will undoubtedly have important results, was largely due to the farsightedness of Charles E. Hildreth, secretary National Machine Tool Builders' Association, and also vice-president and treasurer Whitcomb-Blaisdell Machine Tool Company, Worcester.

The Newport Rolling Mill Company, Newport, Ky., started its sheet mills Nos. 3, 4, 5, 6 and 7 on Aug. 16. These mills represent about half the sheet capacity of the company, and it is understood that they will be operated on full time during the summer and fall months. Extensive improvements have been made at the plant and a greater part of the accumulated stock of both black and galvanized sheets has now been disposed of.

The Lackawanna Steel Company, Buffalo, is completing four additional open-hearth furnaces and expects to have them ready for operation about Sept. 1. The company will then have a total of eighteen standard stationary open-hearth furnaces and two Talbot tilting furnaces. The new furnaces will increase the open-hearth output by about 600 tons per day. All seven blast furnaces are now in operation.

A contract for furnishing the State of Pennsylvania with automobile license plates has been let to the Brilliant Mfg. Company, 1035 Ridge Avenue, Philadelphia, of which Chester P. Ray is president, at its bid of 13¾c. per set for automobiles and 4½ to 6⅞c. for single plates for motorcycles and other vehicles. This bid is $35,456.83 less than the amount expended last year.

Iron and Industrial Stocks

NEW YORK, Aug. 18, 1915.

The influences predominant in the stock market appear to be of a character not easily overcome by unfavorable developments. The disappointing decision of the Interstate Commerce Commission on the proposition to advance Western railroad freights and its decidedly disconcerting decision reducing freight rates to tidewater on anthracite coal, thus cutting down the revenues of quite a number of important railroads, had only a brief effect. Speculators in war order stocks and in iron and steel stocks quickly recovered their poise and the upward tendency continued. Changes in prices in the period under review have been quite rapid in the case of some stocks. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com..	35½- 46½	Ry. Steel Spring, com.	38¾- 42¾
Allis-Chal., pref..	69½- 76	Ry. Steel Spring, pref.	92½- 93
Am. Can, com...	58¼- 64¾	Republic, com...	42¾- 47¼
Am. Can, pref...	106 -107½	Republic, pref...	98¼- 99⅞
Am. Car & Fdy., com.	61¾- 73½	Rumely Co., com.	5⅜- 14
Am. Car & Fdy., pref.	116 -118	Rumely Co., pref.	10⅞- 18¼
Am. Loco., com..	53⅛- 58½	Sloss, com.	46 - 56½
Am. Loco., pref..	98¾- 99	Sloss, pref.	90 - 93
Am. Stl. Fdries..	42½- 56	Pipe, com.	18⅝- 23¼
Bald. Loco., com.	78¼- 83	Pipe, pref.	43 - 47½
Bald. Loco., pref.	105½-106	U. S. Steel, com.	73⅜- 77⅛
Beth. Steel, com.	282½-302	U. S. Steel, pref.	112¾-113¼
Beth. Steel, pref.	139 -180	Va. I. C. & Coke.	50 - 64¾
Colorado Fuel...	40 - 44⅞	West'gh'se Elec.	111¾- 120¾
General Elec....	171¼-176¾	Am. Ship, com..	40½- 43
Gt. No. Ore Cert.	40½- 43⅜	Chic. Pneu. Tool.	77 - 80⅝
Int. Harv. of N. J., com.	105 -109	Cambria Steel...	53⅛- 55
Int. Harv. Corp., com.	70 - 70½	Lake Sup. Corp..	9½- 10¾
Lackawanna Stl.	53 - 55½	Pa. Steel, com.	40
Nat. En. & Stm., com.	22⅝- 29½	Pa. Steel, pref...	84 - 85
Nat. En. & Stm., pref.	87¾- 89	Warwick	9½- 10⅞
Pitts. Steel, pref.	90	Cruc. Steel, com.	72⅛- 83½
Pressed Stl., com.	58¾- 67	Cruc. Steel, pref.	102¾-103½
Pressed Stl., pref.	101	Harb-Walk. Refrac., com.	55
		La Belle Iron, com.	36 - 37

Dividends

The Republic Iron & Steel Company, which had passed several dividends, owing to the business depression, has resumed payments by the declaration of the regular 1¾ per cent on the preferred stock. The board of directors also authorized an extra dividend of ¼ of 1 per cent, leaving 12 per cent of the dividends in arrears on the preferred stock still unpaid. The dividends are payable Oct. 1.

The Canada Foundries & Forging Company, Ltd., 1¾ per cent for the quarter ended July 31, 1914, being the dividend deferred at that time, and 1¾ per cent for the quarter ended July 31, 1915, both payable Aug. 16.

Driggs-Seabury Corporation in New Hands

Negotiations have been completed by which the plant of the Driggs-Seabury Ordnance Corporation, Sharon, Pa., will be transferred to a new company known as the Driggs-Seabury Ordnance Company. The present capital is $1,600,000, and the capital of the new company will be $4,000,000, consisting of $1,000,000 preferred stock and $3,000,000 common stock. The new interest will control the company and John Stevenson, president and general manager, will relinquish these positions, although he will continue to be a large stockholder. The company will make war munitions and other products and will greatly enlarge the plant. A large order for motor trucks for shipment to Scotland has just been received. A meeting of the stockholders of the present corporation will be held in Sharon Aug. 23, when the deal for the transfer of the plant to the new owners will be closed. It is stated that A. E. Borie, formerly vice-president of the Bethlehem Steel Company and later an officer of the Taylor-Wharton Iron & Steel Company, will be the president of the new company.

The American Can Company has leased for its general offices an entire floor in the new Equitable Building, 120 Broadway, New York, and will remove its offices Sept. 1 from the present location at Fourteenth Street and Tenth Avenue.

Brown & Sharpe Apprenticeship System

The apprenticeship system at the works of the Brown & Sharpe Mfg. Company, Providence, R. I., is well described and illustrated in a pamphlet prepared by the company. It gives information on what constitutes the learning of a trade in the plant, the entrance requirements, the conditions of service and the lines of advancement which may follow the successful completion of an apprenticeship. While the greatest emphasis is placed on the machinist's trade, as that is the one lying at the foundation of the company's business, apprentices are also taken in drafting, pattern making, molding, core making and blacksmithing. In each of the trades a variety of work is provided, which is done during working hours under the direction of instructors. The work is of such a character as will tend to preserve the balance in the training of the head and hand.

A boy to be eligible to serve a machinist apprenticeship must be between sixteen and eighteen years of age and have had a good common school education. A point on which special emphasis is laid is that boys should be mechanically inclined and have a natural perception of mechanical matters. A preliminary examination is usually given to show how much knowledge the boy has of simple mathematics. The first twelve weeks of the apprenticeship constitute a trial period, during which the boy is paid at the rate of 8c. per hour. If accepted at the end of this period, the time served becomes a part of the first year's apprenticeship, the entire period comprising four years. At the successful completion of the term of apprenticeship the boy is paid $150. The week's work consists of fifty-five hours, ten hours on the first five days and five hours on Saturday, and the works generally close during the first two weeks in August for an annual vacation. The boys are transferred from one department to another in order that they may learn each part of the work in the department where it is done, and they are also given training in many branches of the trade which are somewhat special in character, but help to give a well rounded experience. Some of the lines which the machinist apprentices regularly take up are centering, lathe work, drilling by the use of jigs, milling, fitting, assembling, screw cutting, grinding, scraping, planing, gear cutting and repair work and in special cases, where the standard of the work previously done by the apprentice is high, tool making.

The school conducted in connection with this apprenticeship course gives instruction in machine-shop mathematics, including linear and angular measurements, screw threads and gearing, calculating feeds and speeds of machinery, indexing, etc., and in drafting, including jig and fixture work, cams, mechanisms, etc., all applied directly to the work of the shop. Examples are selected from the actual work of the shop and in that way become real problems of the ordinary requirements of the trade.

The drafting room apprenticeship period is two and one-half years, six months of which is spent in the machine shop. The patternmaker apprentices have a four-year period like the machinists and are given some experience in the foundry in the course of their apprenticeship. Apprentices at the molder's trade serve for a period of three years and get experience in bench and floor work and in the core room. They also have two hours per week of school work devoted to subjects relating to the trade and tending to increase their efficiency. The core maker's apprenticeship is one and one-half years, while the blacksmith's apprentice term is three years.

The apprentices in the different lines are paid varying rates of wages, the amount increasing with the period of service, and at the completion of the apprenticeship period bonuses are paid. In addition to his wages, the apprentice receives money for contract work and it is also possible to receive a bonus for quality of work and deportment.

The records kept show that out of 227 past apprentices now employed in the works, there are three superintendents, seven department and forty-seven sub-foremen, as well as twenty-five other responsible employees in the sales, engineering and drafting departments. A number of past apprentices are employed as skilled workmen and a still larger number are holding positions of responsibility or those requiring skill, outside of the company's plant.

Book Reviews

Standard Handbook for Electrical Engineers by Frank F. Fowle. Fourth edition. Pages xvi + 1984, 4 x 6⅝ in.; numerous illustrations. Published by the McGraw-Hill Book Company, Inc., 239 West Thirty-ninth Street, New York. Price $5.

The present edition, while retaining the general features and scheme of arrangement followed in the earlier ones embodies so many changes, and so much new matter that it is virtually a new book. It is designed primarily as a reference book of practical information and data for practising engineers and a supplement to the textbooks employed in teaching electrical engineering in colleges and universities. While it is not possible to treat each subject exhaustively, an effort has been made to present as much information and data of a practical nature as space would permit, reference to standard works being made for extended information on theory and highly specialized topics.

The sections have been rearranged to give a rational classification of major subjects and the minor divisions in each main section have been arranged with a view to presenting the information on each subject in a reasonably compact form that could be readily located. Each numbered paragraph opens with a descriptive title, and subheads which are grouped on each section title page are used throughout the sections. This is designed to supplement the general index. The unit system followed in previous editions has been retained and the number of sections has been increased from twenty to twenty-five.

Resuscitation by Charles A. Lauffer, M.D. Second edition. Pages, ix + 90, 4¼ x 6⅝ in. Published by John Wiley & Sons, New York City. Price 50c.

This edition has been greatly enlarged from the first one issued about two years ago. While the book deals primarily with resuscitation from electric and traumatic shocks, drowning or asphyxiation from any cause by artificial respiration induced by the prone pressure or Schaefer method, the use of the pulmotor is touched upon. A synopsis of the Schaefer method for the busy man and data on the success that has attended the use of this method in specific cases are included. Mention is made of the progress that has been made in the adoption of this method by the various departments of the Government and large industrial corporations. Commercial devices for artificial respiration are briefly described and the formation of a bureau for recording cases of resuscitation from electric shocks and allied conditions is recommended.

"The Saw in History" is a 63-page pamphlet published by Henry Disston & Sons, Inc., Philadelphia, to mark the seventy-fifth anniversary of the founding of the Disston house. The dedication is to "that vast army of workers, extending from the crowded centers of civilization into the wilds that mark the limits of man's advance in his conquering march against nature, whose chief weapon is the saw." Part 1, which is brief, is devoted to the ancient saw; part 2, also brief, tells of the beginnings of the modern saw, and part 3 devotes more than forty pages to the modern saw, beginning with the early types of hand saws and coming down to the four-band gang saw in a latter-day mill. The text is plentifully illustrated.

The Michigan Bolt & Nut Works, Detroit, Mich., has issued a booklet for the use of its employees containing the general rules of the plant and accident prevention and first aid instructions. Special emphasis is put on the importance of all the employees being able to speak, read and write English. The accident prevention hints are arranged alphabetically and cover all of the common sources of accidents. Mention is also made of the importance of looking after the eyes and guarding against the infection of small wounds such as scratches, punctures, etc.

PREVENTION OF ELECTROLYSIS

Present Methods for Underground Pipe and Cable Systems of Little Value

WASHINGTON, D. C., August 17, 1915.—The Bureau of Standards is about to publish a report embracing the results of an investigation of electrolytic corrosion caused by stray currents generated for the operation of street railroads, plant tramways, general power purposes, etc. Special attention is given in the report to electrolytic effects observed in concrete and steel buildings; not only the familiar skyscraper, but also buildings constructed largely of steel for industrial plants, in the operation of which heavy electric currents are used. The adequate protection of iron water mains and other pipes and conduit systems is also considered.

All of the various methods of electrolysis mitigation that have been proposed or tried may be grouped under two main heads: first, those methods applicable to underground pipe and cable systems; second, those applicable to the railroad negative return. Those methods applicable to underground pipe systems comprise the following: 1, surface insulation of the pipes; 2, chemical protection, that is, rendering the pipe surface passive by surrounding it with earth filled with lime or other chemical that will prevent corrosion; 3, cement coatings; 4, cathodic protection, that is, maintaining the pipe or cable always negative to earth by means of a motor generator set or battery or other sources of electromotive force; 5, favorable location of pipe with respect to tracks; 6, the use of non-corrodible conducting coatings; 7, electric screens; 8, the use of insulating joints in pipes; 9, pipe drainage.

The investigation made leads to the conclusion that of the various methods under this class that have been tried none are suitable for general use as primary means of preventing electrolysis trouble. The methods of chemical protection, cement coatings, cathodic protection and conducting coatings should be regarded as substantially worthless in their present state of development. Surface insulation of pipes by means of paints or dips is not much more reliable, but insulation by putting pipes in troughs or conduits filled with pitch may be used in special cases where the expense would be justified. The practice of placing all pipes as far as possible from railroad tracks affords a certain measure of protection, of which advantage should always be taken wherever practicable in laying new lines or relaying old ones. The use of electric screens is often a valuable expedient in taking care of acute local cases of trouble in existing mains. These methods, with the exception of that relating to the proper location of pipes in new work, are suitable only to special conditions, however, and are not usually to be considered as important factors in any general plan for electrolysis mitigation.

Pipe drainage is sometimes useful but should be used with proper restriction and with due precautions against setting up any dangerous conditions either in the system drained or in neighboring systems. In general, in city networks where there are a number of independent underground systems to be protected, pipe drainage should be used as little as possible, the chief reliance being placed on mitigative measures applied to the railroad negative return. The drainage of lead cable systems will, however, usually be desirable, and these should always be drained by means of suitable insulated feeder systems so arranged as to drain the least practicable current from the cables in order that neighboring structures may not be subjected to unnecessary danger thereby.

The most valuable mitigative measure that can be applied to the pipe system consists in the proper use of insulating joints, and the extensive use of such joints should be encouraged in new work and in making repairs.

Taking up the methods applicable to the railroad system, it appears that various means may be employed to reduce potential differences in the uninsulated portion of the negative return. These comprise: 1, proper construction and maintenance of way; 2, grounding of tracks and negative bus; 3, use of uninsulated negative feeders; 4, use of insulated negative feeders without boosters; 5, use of insulated negative feeders with boosters; 6, three wire systems and proper number and location of power houses.

The conclusion is reached that the alternating current system, the double trolley system, the use of negative trolley, the periodic reversal of trolley polarity and the use of uninsulated negative feeders in parallel with the rails, when considered solely as methods of electrolysis mitigation, are either impracticable or have greater expense and operating difficulties attending their application than in the case of other adequate methods. The three-wire system, it is pointed out, has large possibilities when viewed solely from the standpoint of electrolysis elimination.

W. L. C.

American Electrochemical Society

The September meeting of the American Electrochemical Society will be held in San Francisco, Sept. 16 to 18. Special transportation facilities have been arranged for by a committee of which J. M. Muir, 239 West Thirty-ninth Street, New York, is chairman. At the time of holding the meeting the American Institute of Mining Engineers and the American Institute of Electrical Engineers will also be in session, and joint meetings have been arranged with these societies for Sept. 17. In the following week the International Engineering Congress will hold its meetings.

The following are among the papers which have been accepted:

"Electrochemical Synthesis of Phenol Hydroxyl Amine," by E. M. Frederiksen. An application of electrochemistry to the production of an organic chemical.

"Electrodeposition of Nickel," by C. W. Bennett, Rose and Tinkler.

"Heat Losses from an Electric Steel Furnace," by Wills and Schuyler. An investigation of the heat losses by gases issuing from the doors, by water cooling of the electrode collars, and by transmission through the electrodes.

"Electric Steel Costs," by F. T. Snyder. An analysis of the cost of making electric steel from cold raw materials on a small scale for foundry use.

"Melting of Ferroalloys in the Electric Furnace," by R. S. Wile. A discussion of the economy in steel-making practice of melting ferroalloys, particularly ferromanganese, in electric furnaces and adding them melted to the steel.

"Solution Stratification as an Aid to the Purification of Electrolytes," by F. R. Pyne. Description of a new method of withdrawing liquor low in carbon from the regular refining baths, by various outlets properly placed, using the principle of stratification.

Snyder Electric Furnace Exhibit at Atlantic City

At the Foundry and Machine Exhibit at Atlantic City, Sept. 25 to Oct. 1, an electric furnace built by the Snyder Electric Furnace Company, Chicago, will be in operation, melting cold scrap and pouring three times each day—at 11 a. m., 2 p. m. and 5 p. m. The major part of the booth will be given over to a molding and pouring floor. The finished castings will be cleaned by auxiliary apparatus in near-by booths and some of each day's output will be machined in the hall. Tests will be made at Philadelphia of castings from each heat and the results will be announced the following day. Each heat will be taken off under the direction of some prominent foundryman. The Snyder electric furnace to be shown is of a regular commercial type and size, 1-ton holding capacity, and 10-ton capacity per 24 hr.

Costs in the steel foundry are discussed in an elaborate article in the monthly publication of the Tropenas Converter Company, 50 Church Street, New York City, and a copy of the pamphlet can undoubtedly be had for the asking.

PERSONAL

W. E. Freeland, who has been connected with the Norton Company at Worcester, Mass., has accepted an appointment to the editorial staff of THE IRON AGE. After several years in the newspaper field and a considerable industrial experience as an executive in production departments, Mr. Freeland was for a time assistant secretary of the Worcester Board of Trade and editor of the Worcester *Magazine*. Later he became assistant advertising manager of the Norton Company and editor of *Grits and Grinds*, the publication of that company and the Norton Grinding Company. More recently he has been head of the sales research division of the sales department of the Norton Company.

George Puchta, president Queen City Supply Company, Cincinnati, has been nominated as Republican candidate for mayor of that city. Mr. Puchta has been prominent in the National Supply and Machinery Dealers' Association as one of its organizers, and for a time as its president.

Cyril J. Bath has severed his connection with the Motch & Merryweather Machinery Company, Cleveland, Ohio, having for the last four years managed its second-hand machinery department, and has opened offices in the Leader News Building in that city for the conduct of a business of his own, dealing in machine tools.

Fred I. Fuller, assistant manager of sales of the American Sheet & Tin Plate Company, Pittsburgh, has returned from a combined business and pleasure trip to the Pacific coast.

H. E. Graham, general freight agent of the Pressed Steel Car Company, Pittsburgh, has been placed in charge of a recently established traffic office of the company in New York City. F. M. Garland, assistant to Mr. Graham, will be in charge of the Pittsburgh traffic office.

Alden D. Perley, assistant to John N. Reese, general superintendent of the blast furnaces of the Republic Iron & Steel Company in Youngstown, Sharon and New Castle, will be placed in charge of Hall furnace at Sharon as soon as it is put in operation.

Dudley R. Kennedy, who has been engaged with the Youngstown Sheet & Tube Company as counselor in the department of safety, welfare, accident and compensation, has accepted a similar position with the Goodrich Rubber Company, Akron, Ohio.

Charles B. Ellis, formerly connected with the American Vanadium Company as an assistant to J. L. Replogle, vice-president and general manager of sales at New York, has become associated with the Bartlett-Hayward Company, Baltimore. Previous to his employment by the Vanadium Company, Mr. Ellis was with the Cambria Steel Company for many years, both at Johnstown and Philadelphia.

Charles E. Carpenter, general manager Allied Machinery Company of America, New York, has gone to the Paris office of the company.

J. O. Hobby, Jr., has been appointed treasurer of the American Locomotive Company.

Ralph H. Upson, of the Goodyear Tire & Rubber Company, winner of the International Balloon trophy in the race that started at Paris in October, 1913, has been selected a member of the special committee to co-operate with the United States Naval Advisory Board in its consideration of the application of aircraft to warfare. President F. A. Seiberling of the Goodyear Tire & Rubber Company, also, has been made a director of the American Society of Aeronautic Engineers, organized at the suggestion of Thomas A. Edison to act with the Naval Advisory Board, of which Mr. Edison is chairman.

J. M. Syme is now superintendent of the screw department of the Brown Bag Filling Machine Company, Fitchburg, Mass. This company, it is understood, has absorbed the J. M. Syme Company, which has been conducting business at Fitchburg as a manufacturer of screw machine products.

Howard S. Grimes, formerly purchasing agent for the Crown Cork & Seal Company, Baltimore, Md., has started a manufacturers' purchasing agency in the Law Building in that city. He will buy materials for machine shops, wood-working plants, etc.

Morris Knowles, consulting engineer, has acquired the engineering business formerly conducted from offices in Pittsburgh, Pa., and Canton, Ohio, by L. E. Chapin, recently deceased, and with whom he was previously associated. He will conduct the combined business from his office in room 2541 Oliver Building, Pittsburgh.

In order to devote his entire time to the affairs of the Pittsburgh Steel Company, Wallace H. Rowe has resigned the presidency of the Pittsburgh Steel Products Company, an identified interest, and has been succeeded in that position by Willis F. McCook. Mr. Rowe remains as president of the Pittsburgh Steel Company.

Developing a Manganese Deposit in Maine

C. Vey Holman, formerly State geologist for Maine, has acquired and is operating at Blue Hill, Me., the deposit of rhodenite which for several decades supplied the manganese for the Katahdin Iron Works, the only blast furnace ever operated in that State. The furnace was abandoned in the early eighteen-eighties and the manganese operation fell into disuse. There is a self-draining open pit on the summit of Blue Hill, the floor of the quarry being 960 ft. above sea level. Some thousands of tons of ore is in sight in the present working face of the quarry. It has been thought that the mass of the hill is rhodenite, or manganese silicate, blanketed with a shell of extremely quartzose schist which escaped glacial erosion only to the extent of being reduced to a thin shell over the core of manganiferous material. Mr. Holman raises the question, after his work of the past few weeks, whether the deposit may not be classified as schefferite (brown manganese pyroxene) of which the chemical and petrographic characteristics approach closely those of rhodenite, though the content of manganese runs about the same.

Preparations are being made to put the ore on the market and a concentrating plant may be installed for bringing up the manganese content and reducing the percentage of silica.

New Process Gear Corporation Again Expands

A deal has just been closed between T. G. Meachem, vice-president of the New Process Gear Corporation, and officers of the Union Typewriter Company whereby the former corporation will acquire ownership of the Monarch Typewriter plant, Syracuse, N. Y., Oct. 1. The Monarch buildings cover two acres, and the surrounding land, which adjoins the property of the New Process Corporation, includes an additional three acres. The main building is five stories high, has a frontage of 480 ft. and extends back 350 ft. The carrying capacity of the floors is to be increased by steel reinforcement from 200 to 300 and 350 lb. per square foot, the additional strength being necessary to provide for heavier material and machinery.

After alterations the Monarch plant will be used by the New Process Corporation as the job gear and spur and transmission gear department, and the present plant will be devoted exclusively to the manufacture of automobile differentials. It is the intention of the corporation to have more than 1000 employees at work before spring, at which time the additional five-story building now being erected on property purchased recently will be completed and equipped.

Sweden's importation of German coke is reported as exceptional recently. It is caused by the high prices of coal in England and the freights. Many Swedish steamers as well as state and private railroads are now using coke, either alone or mixed with coal or wood, with apparently good results as coke imports are continually increasing.

FORD SOCIOLOGICAL WORK

Results of Second Year of Profit-Sharing Show Astonishing Accomplishments

Probably the most tangible measure of the results which the profit-sharing plan of the Ford Motor Company, Detroit, Mich., has effected with respect to the financial welfare of its employees may be found in the subjoined tabulated record for the twelve months ended Jan. 12, 1915. These figures were recently compiled and compare with the statement for the period ended June 12, 1914, as published in THE IRON AGE of Jan. 7, 1915. They also represent the distribution of greatly increased amounts of money in the various communities of Detroit.

Financial Statement of Employees

	Amount Jan. 12, 1915	Increase Jan. 12, 1914, to Jan. 12, 1915	Per Cent Increase
Amount in banks	$3,046,301	$2,049,833	205
Amount of life insurance	6,493,709	4,022,046	163
Value of homes owned	933,524	465,294	99
Value of lots owned	94,136	26,976	40
Value of homes on contract	8,867,159	5,584,828	170
Value paid on homes on contract	3,237,864	2,126,606	191
Value lots on contract	999,327	585,473	141
Amount paid on lots on contract	276,722	175,965	175

Comparative Statement of Home Conditions

	Jan. 12, 1914 Number Investigated	Jan. 12, 1914 Per Cent of Total	Jan. 12, 1915 Number Investigated	Jan. 12, 1915 Per Cent of Total
Good	6,091	46.77	9,911	69.53
Fair	3,961	30.42	3,934	27.60
Poor	2,971	22.81	410	2.87
Total	13,023	100	14,255	100

Comparative Statement of Neighborhood Conditions

	Jan. 12, 1914 Number Homes	Jan. 12, 1914 Per Cent of Total	Jan. 12, 1915 Number Homes	Jan. 12, 1915 Per Cent of Total
Good	5,370	41.43	9,440	66.22
Fair	5,119	39.50	4,510	31.64
Poor	2,471	19.07	305	2.14

Machine Shop Labor Demands

The executive board of the International Association of Machinists in session at Washington has approved a few applications of locals for permission to strike to enforce a shorter day. Vice-President J. J. Keppler announced at New York this week that he would ask the executive board to call a strike in all arms and ammunition factories in the United States and in all other plants where machinists are making demands for the 8-hr. day and higher wages.

At the Garvin Machine Company's plant in New York, where machinists recently went out on a strike for the 8-hr. day, it was stated this week that 173 men are now at work, a considerable proportion of these men coming from the strikers' ranks.

W. H. Johnston, president of the International Association of Machinists, makes the statement that in the past ten weeks 10,000 machinists have gone from this country to England, many of them on a six-months' contract at $5.50 a day with bonuses. Union officers say that metal workers in all the government navy yards and arsenals will demand an increase in wages of 15 to 25 per cent. The men at the Washington Navy Yard have already asked for a 25 per cent increase.

The Bridgeport Manufacturers' Association, in a statement issued Aug. 14, recommended the adoption in all Bridgeport, Conn., plants of a 50-hr. week in view of the demand of the machinists' union for an 8-hr. day.

The Colt Patent Firearms Mfg. Co., Hartford, Conn., paid its employees on Aug. 14 the first installment of the bonus on profits recently offered in lieu of the 8-hr. day. The men received about $45 each.

James L. Geddes, president Kelly-Springfield Motor Truck Company, Springfield, Ohio, announces that a general convention of the sales representatives of the company will be held in Springfield, Aug. 26, 27 and 28. The gathering will include the branch managers, factory representatives and leading agents from all sections of the country.

OBITUARY

J. C. WILLIAM GRETH, Pittsburgh, died Aug. 7 at his summer home in Gibsonia, Pa., aged 41 years. He had been in poor health for more than a year. He was born in Buffalo and was graduated from Cornell University in 1897 as an electrical engineer. He was the author of numerous articles on engineering and frequently read technical papers before engineering organizations. He was a member of the Engineers' Society of Western Pennsylvania, American Society of Mechanical Engineers, American Society of Civil Engineers, and the American Chemical Society. At the time of his death he was manager of the water purifying department of the William B. Scaife & Sons Company.

MENDES COHEN, for years one of the leading civil engineers of the country, died Aug. 13 at his home, Roland Park, Md., aged 84 years. He had been in ill health for a year. Born in Baltimore, he began his career in the locomotive works of Ross Winans. From 1855 to 1875 he was with the Baltimore & Ohio Railroad Company and played an important part in the early expansion of that road. He also served in various capacities with the Hudson River, the Ohio & Mississippi, the Philadelphia & Reading, the Lehigh Coal & Navigation and the Pittsburgh and Connellsville companies.

THOMAS D. BRADSTREET, vice-president and general manager, Seth Thomas Clock Company, died at Thomaston, Conn., Aug. 15, aged 74 years. He was a native of that place and entered the employ of the company in 1873 as a bench hand, steadily rising until he attained his high position. He was prominent in public affairs, having been a member of both the upper and lower houses of the Connecticut Assembly, as well as State Comptroller for three terms. He leaves his widow and a daughter.

MORTON DECKER, president and general manager of the Standard Separator Company, dairy machinery, Milwaukee, Wis., was found dead in the bathroom of his residence on Aug. 10. All gas jets in the room were turned on. He was born in Sussex County, N. J., in 1853 and achieved wide note as an inventor and designer of butter and cheese factory equipment. No reason is known for his suicide. The affairs of the company are stated to be in the best condition.

LEWIS D. CLARK, president Youngstown Forge Company, Youngstown, Ohio, died in his home in that city Aug. 15, aged 65 years. He was born in Aberamon, Glamorganshire, South Wales, coming to this country at the age of 18, and from that time being actively engaged in the iron business until two years ago, when he retired to some extent. He leaves his widow, four daughters and two sons.

WILLIS B. BURNS, president Syracuse Malleable Iron Company, Syracuse, N. Y., died Aug. 15, aged sixty-five years. He was prominently identified with public affairs, having been an alderman, a member of the New York Assembly and mayor of the city.

FRANK P. PFLEGHAR, president and treasurer of the Pfleghar Hardware Specialty Company, New Haven, Conn., died Aug. 14.

The firm of A. Milne & Co., steel and iron merchants, will be continued by the surviving partners, Luther Little and James K. Hoyt, under the same firm name and at the present addresses, as follows: New York, 741-745 Washington Street; Boston, 8 Oliver Street; Chicago branch, 550 Washington Boulevard.

The local court has given permission to the receivers of the Central Iron & Steel Company, Harrisburg, Pa., to enlarge the capacity of the open-hearth department and to erect a four-girder ladle crane of 150 tons capacity. The crane will cost $28,000. Robert Irons is superintendent.

Pittsburgh and Nearby Districts

The Mesta Machine Company, Pittsburgh, has received an order from James B. Ladd, consulting engineer, Philadelphia, for a 1500-hp. engine for the Broken Hill Proprietary Company, Ltd., New Castle, N. S. W., Australia. The engine is for rolling-mill service and is of the heavy-duty tandem-compound Corliss valve type. The cylinders are 30 in. and 54 in. in diameter and the stroke 48 in. This engine, when installed, will make the fourth Mesta unit built for the Broken Hill Company, as three Mesta long-cross-head blowing engines, equipped with Mesta automatic plate valves, Iverson patent, were shipped about two years ago.

The George J. Hagan Company, Pittsburgh, has taken a contract to build for the McKeesport Tin Plate Company, McKeesport, Pa., 20 sheet and pair furnaces and seven annealing furnaces, all to be designed for the Hagan new model underfeed stokers. The Hagan Company will also make extensive alterations to the present 22 sheet and pair furnaces, the entire contract being almost equal to the building of 40 furnaces. Orders have also been received for two tin-mill sheet furnaces and two Allis continuous tin-mill pair furnaces for the Wheeling Steel & Iron Company, Yorkville, Ohio, to be fired with Hagan stokers. Other orders include six Hagan stoker-fired sheet and pair furnaces and two double length annealing furnaces for the Empire Rolling Mill Company, Cleveland, Ohio; two forge furnaces for Johnson & Jennings, Cleveland, and four graphite kilns for the International-Acheson Graphite Company, Niagara Falls, N. Y., all to be fired with Hagan stokers. The company will shortly ship eight of these stokers to the Phillips Sheet & Tin Plate Company, Weirton, W. Va., and expects soon to close considerable other work.

The Republic Iron & Steel Company will start its Hall furnace at Sharon, Pa., as soon as it can be made ready. It will also start its No. 3 Bessemer stack at Thomas, Ala., in a short time. The company will then be operating its four large stacks at Youngstown, its Atlantic furnace at New Castle, its two blast furnaces at Sharon and its three stacks in Alabama and its output of pig iron will be on the basis of more than 1,000,000 tons per year. The report that the company had given employment to a large number of destitute miners from the Hocking Valley district coal fields is without foundation.

On Aug. 10 the blast furnace of the Struthers Furnace Company, Struthers, Ohio, turned out 501½ gross tons of basic iron. The furnace is rated at 400 tons per day, but in the first 10 days of August made an average of 497 tons.

It is stated that a large Cleveland steel interest is negotiating to take over the blast furnace of the Leetonia Steel Company, Leetonia, Ohio.

The idle blast furnace of the Carnegie Steel Company at Farrell, Pa., will be put in operation shortly. With this and others started, for which arrangements are being made, all the furnaces in the Shenango Valley will be in operation except a small stack owned by the Sharpsville Furnace Company, Sharpsville, Pa., which has not been operated for a long time. Its capacity is only 150 to 175 tons of iron per day.

It is reported, but not confirmed, that the Wheeling Steel & Iron Company, Wheeling, W. Va., has definitely decided to add 12 hot tin mills, with all necessary equipment of heating and annealing furnaces, pair furnaces, shears and other machinery, to its tinplate plant at Yorkville, Ohio. It is also stated that the company will add a sheet-bar mill to its Bessemer steel plant at Wheeling, and will also remodel its pipe mills, a definite decision on which will likely soon be reached.

Rapid progress is being made in the erection of the new spelter plant of the American Steel & Wire Company at Donora, Pa. The foundation work, by the Dravo Contracting Company, Pittsburgh, is nearly completed. There will be quite a number of small buildings, all of which are being erected by the American Bridge Company, requiring 7000 to 8000 tons of steel. The plant will contain 10 furnaces and the company will make its own crucibles. Probably 1500 men are now at work on the plant and it is expected to be ready for making spelter about Jan. 1.

The Youngstown Sheet & Tube Company is adding 11 boilers to its plant at East Youngstown, Ohio, to be equipped with Sanford-Riley 6-retort underfeed stokers. At its rod and wire mills at Struthers, Ohio, the company has recently installed four additional staple lock fence machines of its own new design. The Western Conduit Company, a subsidiary of the Sheet & Tube Company, is adding to its plant 12 vertical conduit machines for making Realflex conduit, increasing the capacity 300 per cent.

The Trussed Steel Concrete Company, Youngstown, Ohio, has secured a contract for reinforcing steel for a new court house being erected at Walla Walla, Wash., amounting to about $15,000. The company is operating its plant to full capacity.

Press reports to the effect that the National Tube Company, Pittsburgh, would build large new mills at Wheeling, W. Va., at a cost of $5,000,000, are officially denied. The company has no new construction under way at present in the Wheeling district, and none is contemplated in the near future.

The Struthers-Wells Company, Warren, Pa., states the report is incorrect that it has been offered an order for rifles from Russia. Opportunity has been presented for taking contracts for shrapnel shells, but the company declined the business. Its specialty is the building of all kinds of steel plate construction. The report is also incorrect that the company's books are filled with business; while not suffering from want of orders, the plant is not so overwhelmed with work that very fair service cannot be given on either welded or riveted steel plate construction.

The Steel Car Forge Company, Pittsburgh, will build a new machine shop at its plant at Ellwood City, Pa., and the company will be in the market for a considerable number of iron-working tools.

A special meeting of the directors of the La Belle Iron Works was held at Steubenville, Ohio, on Tuesday, Aug. 17, at which the plan of the company to erect probably 96 by-product coke ovens was considered, but nothing definite was settled. The company has two or three sites in view on which to build these ovens and will likely decide within a week or two. Its No. 2 blast furnace, which is being relined and repaired, will likely go in blast about Sept. 1.

Hartford Machine Screw Company's Additions

Important additions to the plant of the Hartford Machine Screw Company, Hartford, Conn., are nearing completion. In May several old buildings, including the offices, were torn down to make room for two much larger buildings. One of these is a six-story structure, 46 x 206 ft., and the other a two-story building, which together give a total increase in floor space of about 80,000 sq. ft. A convenient railroad siding is being constructed, which improves shipping facilities considerably. In addition to housing the new general offices of the company, designs for furnishing of which contemplate the most modern and approved equipment and efficiency devices, the new buildings will afford space for extensive additions to manufacturing facilities. The equipment, which is of the latest type, is being installed as rapidly as possible. Increased production of Master spark plugs and Master garage tire pumps, the demand for which is rapidly exceeding the capacity of present facilities, will then be secured. It is expected that the new buildings will be occupied and all machinery running Sept. 1.

The American Foundrymen's Association headquarters at Atlantic City for the convention of Sept. 28 to Oct. 1 will be at the Hotel Traymore instead of the Marlborough-Blenheim, which was originally chosen.

A sales agency of the Allis-Chalmers Mfg. Company has been established at 1429 Munsey Building, Baltimore, Md. O. H. Bordner, formerly of Cincinnati, is the manager.

Thomas Iron Company Report

In the report of President R. H. Sweetser of the Thomas Iron Company, Easton, Pa., covering the operations of that company for the year ended June 30, 1915, emphasis is laid upon the fact that the company has come through the unusual disturbance and depression of the past two years in better financial and physical condition than it was when it entered upon the period beginning July 1, 1913. Referring to the special difficulties of the situation the report says: "Two years ago the company was obligated to receive and pay for over $1,000,000 worth of iron ore, a conservative and forehanded amount in normal times. But the sudden adverse turn of the iron market brought about a need for less than one-fourth as much. At that time the cost of making a ton of pig iron in our blast furnaces was about $2 more than the price we could obtain for it in the rapidly falling market." In addition were adverse conditions at the company's Richard iron mine, the known veins being nearly worked out and the cost of the ore excessive. In spite of all these accumulating difficulties, the year has brought encouraging developments. The report says:

Your board of directors has met every obligation and has brought the company through with its organization and business intact, its credit unimpaired, two furnaces and two iron mines in good active operation, No. 3 furnace at Hokendauqua and No. 10 furnace at Hellertown ready with new linings, thus having about 75 per cent of the furnace capacity ready for operation. By the discovery of large veins of ore east of the offset at Richard mine we have opened up a very large tonnage of iron ore within our own property and we have acquired by lease from the Wharton Steel Company 38 acres of the Allen mine adjoining our land on the east, thus doubling our ore supply at Richard mine. This ore is to be paid for on a royalty basis. We have already advanced 225 ft. along a solid vein of ore in the Allen property. In order more economically to mine the ore from the Allen mine property and the remainder of the ore in the Richard mine property, your board of directors has authorized the sinking and equipping of an up-to-date, four-compartment, vertical shaft near the northeast corner of the Richard mine tract. It will probably take 20 months to complete this work, but it will enable us to hoist at greatly reduced cost from 10,000 to 20,000 tons of ore per month. The preliminary work on this shaft was begun in July.

The average number of furnaces in blast in the fiscal year was two out of eight. Pig-iron production was 52,656 tons or 44,688 tons less than in the preceding year. Stocks of iron were reduced from 14,224 tons to 10,010 tons. Ore mined in the year from Richard mine was 47,383 tons, making a total from this mine of 3,154,355 tons.

Expenditure in extraordinary repairs and renewals of blast furnaces in the year was $67,648. The profit from the year's business was $37,901.97, as against a loss of $50,363.12 for the previous year. Income from dividends on the company's railroad properties and from miscellaneous sources was $160,760.75. The expense of operating furnaces was $757,619 and the revenue from pig iron sales was $710,965, making the loss on pig iron $46,654. The expenses of inactive plants were $69,063. Total deductions from net revenues were $122,858.78, making net corporate income $37,901.97. Items charged off were $60,845, including $25,330 reduction in inventory value of Lake ores and $26,872 on coke shortage at Hokendauqua.

The company's capital stock is $2,500,000 and there are $271,000 in bonds outstanding. Current liabilities are $377,324 and current assets are $223,040 in cash and bills and accounts receivable, $136,443 in pig iron on hand and $258,241 in raw material and supplies on hand at furnaces and mines. Surplus is $1,459,569.

The Walter A. Zelnicker Supply Company, St. Louis, has purchased the stock of the Bintliff Supply Company, successor to Bintliff & Herb, who did a general railroad, mill and factory supply business, specializing in railroad track tools. The stock bought includes Jim Crow rail benders, track drills, etc.

Shipments of manganese ore from Brazil continue to reach Sparrows Point, Md. Two vessels carrying a total of more than 14,000 tons recently arrived.

Spelter Production First Half of 1915

The production of spelter in this country in the first six months of the year has been compiled by C. E. Siebenthal of the United States Geological Survey with the following results expressed in net tons:

The output of spelter was 207,634 tons made from domestic ores and 8898 tons from foreign ores, a total of 216,532 tons as compared with 177,991 tons for the preceding six months and with 175,058 tons for the first six months of 1914. In addition there was produced by distillation from drosses and skimmings 13,546 tons of secondary spelter as compared with 10,273 tons, the half of the 1914 output of distilled secondary spelter. No statistics were obtained of the spelter produced by remelting skimmings, drosses, etc., but it was probably not less than 12,000 tons. The total output of spelter from both ore and skimmings was therefore about 242,000 tons, or at the rate of 484,000 tons per year. The whole number of retorts in operation in June was about 127,000, but many of these had been but recently put in operation. Additional retorts to the number of over 32,000 have since been completed, are under construction, or are planned.

The apparent domestic consumption for the six months' period was 160,906 tons, against 149,762 tons in the preceding six months and 149,306 tons in the first six months of 1914. The spelter stock on hand at smelters was 5884 tons, an average of about 150 tons each for the plants reporting.

Bethlehem Additions in New Finished Lines

Detailed references have been made recently to a large new construction program under consideration by the Bethlehem Steel Company, which will absorb $25,000,000 of the expected earnings on war orders. The *Wall Street Journal*, which has had a number of authoritative statements concerning the operations of this company, refers to new construction which is planned or under way, including four new blast furnaces, sheet and tin-plate mills and wire mills, in addition to capacity for rolling steel plates. No definite statement has been made officially concerning the further plans of extensions by the Bethlehem Steel Company. It is well known, and has been stated in these columns, that considerable additional property east of the present Saucon location was bought some time ago, also that this new tract will be utilized from time to time for additions. What new lines of manufacture will be entered upon has not been determined. Naturally, more blast furnaces will be built and additional steel-making capacity will be provided. That much is more certain than the particular forms of finished product into which additional steel output will be turned.

Waste Material Dealers' Meeting

The adjourned meeting of the National Association of Waste Material Dealers will be held at the Hotel Rudolf, Atlantic City, N. J., Aug. 20, at 2 p. m. The date of the next regular meeting falls on Sept. 21, but the executive committee, believing that a meeting held at Atlantic City in August might be the means of bringing together more of the members from the West and South, suggested to the general meeting in June that that meeting be adjourned to the date and place mentioned. On Aug. 19 and 20 there will be meetings of the various divisions, committees, etc., aside from the general meeting. The Sept. 21 meeting, if held, will probably be held in New York, but definite action regarding this meeting will be left to the meeting of Aug. 20. Meetings will all be confined to Thursday afternoon, Thursday evening and Friday, leaving Saturday and Sunday free to enjoy the attractions of the famous seaside resort.

Representatives of foundries, manufacturers' associations and molders' unions met with the Pennsylvania State Industrial Board at Harrisburg, Pa., last week to discuss the new safety and sanitation code for foundries to be issued shortly. Edwin Mulready, Commissioner of Labor of Massachusetts, was present.

Judicial Decisions

ABSTRACTED BY A. L. H. STREET

ACCEPTANCE AS ELEMENT OF DELIVERY.—Defendant contracted to buy machinery to be shipped to him by plaintiff, but before shipment gave notice to plaintiff that his order must be cancelled. Disregarding this notice, plaintiff delivered the machinery on defendant's premises in the face of his declaration that he would not accept or pay for the same, and later sued to recover the price. Held, that defendant rendered himself liable in damages for breach of the contract, but that he could not be held liable for the price of the machinery on the theory of delivery to him, since acceptance by a buyer is an essential element of a delivery. When a buyer repudiates an unperformed contract he subjects himself to liability for all damages sustained by the seller up to that time, but the seller cannot enhance his recoverable damages by incurring additional expense in attempting to make delivery in face of the buyer's announced repudiation. (North Dakota Supreme Court, Hart-Parr Company vs. Finley, 153 Northwestern Reporter, 137.)

INJURY HAZARDS WHICH ARE ASSUMED BY EMPLOYEES.—The risks assumed by an employee are those ordinarily incident to the particular work he is employed to do, and where he is temporarily transferred from his usual work to other employment involving different or greater dangers than those incident to the work covered by his employment, he does not, by obeying such orders, necessarily assume the risks incident to such other work. This rule is applicable to a case where a foundry employee, who was employed to chip castings, was ordered to temporarily assist in flogging castings. (Indiana Appellate Court, Carbone vs. American Steel Foundries Company, 109 Northeastern Reporter, 220.)

SHIPPER'S RIGHTS UNDER CONFLICTING FREIGHT RATES.—If a carrier's published freight tariffs contain conflicting rates covering a given shipment, the shipper is entitled to the benefit of the lower rate. (New York Supreme Court, Appellate Term; Dreyfuss vs. Pennsylvania Railroad Company; 153 New York Supplement, 966.)

ALTERATION OF CONDITIONAL SALE CONTRACTS.—When a conditional sale contract and a note, intended to evidence a single transaction, appear on a single sheet of paper, the act of the seller in detaching the note, thus constituting it a negotiable instrument, constitutes such material alteration of the contract without the consent of the buyer as invalidates both instruments. (Michigan Supreme Court Reports, Toledo Scale Company vs. Gogo, 152 Northwestern Reporter, 1046.)

TIME FOR ORDERING GOODS CONTRACTED FOR.—Under a contract to sell a quantity of steel, whereby the buyer agreed to order delivery either within a reasonable time, or to do everything possible to that end, what constituted a reasonable time depended on the situation of the parties, the quantity of steel the buyer had on hand, the amount contracted for, the capacity of the buyer's plant to use steel, and any other facts within the contemplation of the parties at the time the contract was entered into. (Michigan Supreme Court, Barlow vs. Lincoln-Williams Twist Drill Company, 152 Northwestern Reporter, 1034.)

AWARD OF COMPENSATION FOR LOSS OF REMAINING EYE.—Under the Michigan Workmen's Compensation Act where an employee, in previous employment has lost the sight of one eye, on loss of the remaining one he is not entitled to an award as for total sight disability, but merely to the same award he would have received had the first eye remained unimpaired. (Michigan Supreme Court, Weaver vs. Maxwell Motor Company, 152 Northwestern Reporter, 993.)

DISCHARGE OF HOT WATER INTO STREAMS.—Although the owner of an industrial plant situated on a river bank is entitled to make reasonable use of the waters of the stream, regard must be had for the rights of other riparian owners down the stream. Hence, a manufacturer who draws water from a river for cooling purposes in connection with condensing machinery may be enjoined from returning the water heated to such temperature as to destroy the right of a lower owner to harvest ice which would otherwise form on the river. (United States Circuit Court of Appeals, Seventh Circuit, Sandusky Portland Cement Company vs. Dixon Pure Ice Company, 221 Federal Reporter, 200.)

WARRANTY OF EFFICIENCY OF MACHINERY.—Under the rule of law that where machinery is manufactured for a certain purpose, the manufacturer is presumed, in making a sale, to warrant that the machinery is reasonably fit for that purpose, a purchaser of an underfeed mechanical stoker is entitled to recover damages resulting from inability to use the stoker without filling his plant with smoke and gas to such extent as to actually interfere with operation of the plant in which the machine was installed. (Nebraska Supreme Court, Underfeed Stoker Company vs. Farmers' Co-Operative Creamery & Supply Company, 152 Northwestern Reporter, 741.)

ABANDONMENT OF PATENTS.—A patentee or his successor does not lose his right to protection under a patent, even if he does not continue manufacturing under the patent, unless an intention is shown to abandon his invention. (United States District Court, District of Massachusetts, American Brake Shoe & Foundry Company vs. Hoadley Brake Shoe Company, 222 Federal Reporter, 327.)

SCOPE OF COMPENSATION ACT.—An employee engaged in dumping cars of heated iron briquettes in the open air is entitled to an award under the Wisconsin workmen's compensation act for injury received through being struck by a car which was run to his place of work by gravity, although, instead of being engaged in dumping another car, he was sitting or lying on the track, warming himself near the unloaded car; he being entitled to protect himself against danger of exposure to cold weather then prevailing. (Wisconsin Supreme Court, Northwestern Iron Company vs. Industrial Commission, 152 Northwestern Reporter, 416.)

LIABILITY OF GUARANTORS OF ACCOUNT.—Plaintiff refused to fill an order for goods ordered by a corporation unless defendants, officers of the company, would personally guarantee payment of the price. The guaranty was given, but delivery was delayed pending its receipt. Held, that plaintiff's failure to make delivery within the time specified in the order did not discharge the defendants' liability on their guaranty. (Michigan Supreme Court, Sheldon Axle Company vs. Landman, 152 Northwestern Reporter, 914.)

BANKRUPTCY OF MICHIGAN CORPORATIONS.—The directors of a corporation organized under the laws of Michigan may involve the company in bankruptcy by admitting in writing that the corporation is unable to pay its debts, and is willing to be adjudged a bankrupt. (United States District Court, Eastern District of Michigan; in re Detroit Body Company; 222 Federal Reporter, 569.)

UNFAIR COMPETITION IN UNPATENTED DEVICES.—Although all manufacturers are at liberty to market and sell a device not protected by a patent, the inventor is entitled to enjoin a competitor from putting articles on the market and using advertising matter in imitation of his product and advertising matter, if the result of the imitation tends to deceive the public to the prejudice of the inventor as to the source of manufacture. (United States District Court, Eastern District of Pennsylvania; Stewart vs. Hudson; 222 Federal Reporter, 584.)

COUNTERMAND OF MANUFACTURING CONTRACTS.—The fact that a contract for the manufacture of goods contains a clause stating that the agreement shall not be subject to countermand by the buyer does not entitle the manufacturer to continue work under the contract after the buyer has declared a repudiation of the contract, and thereby enhance the damages recoverable on account of the purchaser's breach. (Arkansas Supreme Court, Williams vs. Moore, 175 Southwestern Reporter, 1198.)

Machinery Markets and News of the Works

COMPLETING BIG PLANTS

War Munitions Making Soon at Maximum

Automobile Manufacturers Next Active to War Buyers—Two Railroads to Purchase Soon—Notable Plant Changes in New England

Several of the large developments which owe their inception to the placing of heavy war orders are approaching completion and the next step will be the installation of the large numbers of machine tools, most of which have been purchased. The plant of the Remington Arms Company, Eddystone, Pa., is nearly completed, and that of the Eddystone Munitions Company is expected to be in readiness in about ninety days. The latter company has a contract for $80,000,000 worth of munition, but has not yet purchased all of its machinery. Further action awaits the arrival of representatives of Russia with samples of the shrapnel fuses to be made. The Baldwin Locomotive Works has closed a contract with the Philadelphia Electric Company for 10,000 to 12,000 hp. to be supplied to its Eddystone plants. In the New York market large sales and inquiries have continued to hold the attention of the sellers. The automobile makers have been good buyers; in fact, second to the munitions makers. Action is expected soon on the lists of the Lehigh & New England and the Seaboard Air Line railroads.

In Baltimore a most important development is that of the Bartlett-Hayward Company, whose plant to manufacture war munitions is to include 22 buildings, 20 of which will be 176 x 300 ft. Plans are being made for the direct shipment of shells from Baltimore to Europe. The Poole Engineering Company, Woodberry, Md., has secured an additional war order.

From New England it is reported that the J. Wallace Mfg. Company has leased the factory of Smith & Wallace, Woburn, Mass., manufacturers of armature machinery, and will utilize it for turning out a big war order. A force of 500 men will be employed. The New England Westinghouse Company has bought the drop forge plant of Page-Storms, Chicopee, Mass. The latter plant has been busy on tools for the Westinghouse Company. The Heald Machine Company, Worcester, Mass., has let a contract for a new shop, 160 x 200 ft.

In Detroit there has been a steady stream of orders, with an occasional large one, in which second-hand machinery has played a prominent part. In Cincinnati, second-hand machinery is in such demand that records are being broken. The automobile manufacturers have contributed heavily to the demand in that city. An observation from Cincinnati is that the higher wages now being paid are offsetting the higher prices obtained for machine tools. Practically every metal-working plant in Milwaukee County, Wis., is working night shifts.

The addition to the Toledo plant of the Willys-Overland Company will add 23 acres of floor space to that already large plant. The company, as heretofore noted, has been a heavy buyer of equipment.

The Pacific Northwest is building high hopes on its coming exports to Vladivostok by way of Seattle, and with good reason, for in the six months of this year the exports increased from $92,000 to $4,171,000.

New York

NEW YORK, Aug. 17, 1915.

In point of volume, after the war orders undoubtedly come those of the automobile manufacturers and the makers of automobile parts. The Morrow Mfg. Company, Elmira, N. Y., which has been a heavy purchaser of late, has let a contract for an addition to its plant which will require 400 tons of steel. The large purchases made by this company have been previously referred to. Included were upward of $80,000 worth of flat top turret lathes. The Hess-Bright Mfg. Company, Philadelphia, Pa., is inquiring for 12 large turret lathes, additional to the several recently purchased. The Standard Roller Bearing Company, Philadelphia, has an inquiry out for an indefinite number of multiple-spindle automatic screw machines with a 4½-in. spindle capacity, and also a number of turret lathes.

The war business shows no decrease so far as inquiries are concerned, and the situation is unchanged with regard to deliveries, except that these are a trifle further off with most companies. Industrial managers are reluctant to make purchases where such long deliveries are involved and some tool builders have tried to ease the minds of intending purchasers by agreeing to allow cancellations, where only one or two machines are involved, up to the end of the year. At least one of the companies having war contracts is so disappointed with the backwardness of delivery on tools which it has purchased that it is talking of beginning a lawsuit against the tool builder.

Buying by the Eddystone Munitions Company, which has an $80,000,000 contract for Russian shrapnel shells and fuses, will not take place until Russian representatives arrive in this country with samples of the type of fuses which are required. Captain Wilhelm, formerly of the Frankford, Pa., Arsenal, is in charge of the company's production department.

The General Electric Company is inquiring for 60 large turret lathes which, it is understood, are to be exported to Russia. Recent inquiry has called for 700 turret lathes for export. Exporting houses report the foreign demand to be keeping up, although the situation is complicated by the activity of a number of speculators, many of whom are of questionable financial standing. An inquiry for fifty ⅝-in. screw machines for export to Russia has been in the market, but at last report without finding quotations.

The Lehigh & New England Railroad has placed orders for cranes for its Penn Argyle, Pa., shops, and is expected to take some action soon on its machinery list. The Seaboard Air Line is expected to close against its list, issued some weeks ago, in the week of Aug. 23.

The Bethlehem Steel Company, which is expected to come into the market at an early date for additional shell-making machines, has recently bought some shop cranes. The company has purchased the Detrick & Harvey Machine Company's plant at Baltimore, Md. It is stated that it will continue to be operated as a general machine shop for the Bethlehem Steel Company.

The C & C Electric & Mfg. Company, Garwood, N. J., is inquiring for five 1 or 1¼-in. screw machines. The Baldwin Locomotive Works recently bought two 2¼-in. turret lathes on which it was compelled to accept January delivery.

The McIntosh & Seymour Corporation, Auburn, N. Y., which is producing a new type of Diesel engine, has recently bought some machine tools.

Representatives of crane manufacturers in this district are receiving a goodly number of inquiries, but many are slow in closing. The William Cramp & Sons Ship & Engine

Building Company, Philadelphia, will install some exceptionally large cranes. Two of these will have a span of 154 ft. and two will span 126 ft. The company is also to install a large dock crane. Improvements are being made also by the Fore River Ship Building Corporation.

The American Ice Company, 1480 Broadway, New York City, has sold bonds for $3,711,000 and will use the entire amount for new construction. Plans include a plant at Philadelphia of 200 tons a day manufacturing capacity and the enlargement of the present plant there to 100 tons capacity; a new plant at Baltimore of 100 tons a day capacity; the addition of equipment to the Atlantic City, N. J., plant of 50 tons a day capacity. Wesley Oler is president.

The American Can Company, 447 West Fourteenth Street, New York City, has awarded contract to the Dollard Construction Company, Syracuse, for the construction of an addition to its plant at Geneva, N. Y. Details are not yet available.

The McKinnon Chain Company, Buffalo, N. Y., has awarded contract to Morris & Allen, Buffalo, for the construction of a one-story brick concrete addition, 70 x 80 ft., to cost about $10,000.

The Standard Water Systems Company, manufacturer of stills, tanks, boilers, etc., Hampton, N. J., is in the market for a 10-in. boilermaker's flanging clamp.

The Union Forging Company, Union, N. Y., has let contracts for an addition, 115 x 136 ft., one story.

Contract has been let for a boilerhouse to be erected by the Savage Arms Company, Utica, N. Y., 50 x 120 ft., one story.

The American Radiator Company, Buffalo, has taken out building permits for erection of two additional factory buildings at its Pierce plant at the New York Central Railroad Belt Line and Ledger Street, to cost $55,000.

The Graphite Products Company, Saratoga Springs, N. Y., is building a factory, 65 x 80 ft.

The power plant of Endicott, Johnson & Co., manufacturer of boots and shoes, Lestershire, N. Y., is to be enlarged to double its present capacity. A 2000-kw. steam turbine will be installed.

The Advertising Mfg. Company, Buffalo, N. Y., recently incorporated with a capital stock of $200,000, has purchased the factory of the Ideal Furniture Company, East Jamestown, N. Y., and will build an addition 40 x 200 ft., one story, of reinforced concrete. Special machinery for the manufacture of matches will be installed. James M. Thompson is president and general manager.

The Rome Brass & Copper Company, Rome, N. Y., has let contract for the erection of an addition to its casting shop, 140 x 200 ft., one story.

The City of Oswego, N. Y., has authorized the preparation of plans for the construction of a water power plant on the Oswego River at High Dam, on a site belonging to the city.

Philadelphia

PHILADELPHIA, PA., Aug. 16, 1915.

The Baldwin Locomotive Works recently closed a contract with the Philadelphia Electric Company for power to operate their plants at Eddystone. The agreement calls for from 10,000 to 12,000 hp. It is stated that the Remington Arms Company plant is virtually ready for operation. The machinery is now being installed. The shell-making plant of the Eddystone Ammunitions Company will be completed in about ninety days.

The Woodhouse Chain Works, manufacturers of welded chains, Third and Schenck Streets, Trenton, N. J., have built a small addition to their factory to accommodate work received from the United States Government.

C. V. Hill & Co., manufacturer of refrigerators, Trenton, N. J., will build a one-story factory, 100 x 500 ft., of iron and steel sash construction.

The David Berg Distilling Company, Swanson and Tasker Streets, Philadelphia, received bids Aug. 14 for cooper shops and pumphouse, 22 x 140 ft.

William Steele & Sons Company, 1600 Arch Street, Philadelphia, has started the construction of a two-story factory, 110 x 180 ft., and a boiler and pump house, 42 x 80 ft., for the National Umbrella Frame Company, Thirtieth and Thompson Streets, Philadelphia, to be erected at a site recently acquired at Bellfield and Stenton Avenues.

The Pennsylvania Railroad has acquired a portion of Pioneer Island, Pottsville, Pa., from the Eastern Steel Company and will erect a roundhouse and shops.

Contract has been awarded to George E. Pierson, 4507 North Twentieth Street, for a one-story machine shop to be erected at Broad Street, south of Wyoming, for M. M. Byron, at an estimated cost of $1,000. It will be of brick, 18 x 50 ft.

The Nuss Mfg. Company, Harrisburg, Pa., maker of band instruments, is enlarging its plant.

The new plant of the Aetna Powder Company at Mount Union, Pa., is fast nearing completion and will be placed in operation within a week or ten days.

The Jeanesville Iron Works, a subsidiary of the International Pump Company, with a plant at Hazleton, Pa., is reported to have obtained an order for shrapnel. The order is reported to be worth $5,000,000.

An order for 1,400,000 lb. of floor plates has been obtained by the Buchanan Foundry, Lebanon, Pa. The source of the order is not announced; but it is reported to be for one of the European nations for collapsible bridges. The company will enlarge its plant. Clarence Brown is manager.

The Myers Machine Tool Company, Columbia, Pa., has purchased the Triumph Laundry Building, a two-story brick structure, 30 x 130 ft., adjoining its works, and will utilize it in extending its plant. The company has enough orders now booked to run the plant for a year, and the working force is being steadily increased.

The Unit Construction Company, Philadelphia, Pa., has been incorporated with a capital of $25,000 to manufacture automobile bodies, etc. Rayburn Clark Smith, Wynnewood, Pa., is treasurer.

The Bearings Company has been incorporated with a capital of $10,000 by Frank K. Stehle, 684 Broad Street, Philadelphia; Herman P. Schade, Cynyd, Pa., and Charles A. Keffer, Parbarough, Pa., to manufacture bearings.

A state charter has been granted the Knoll Mfg. Company, Reading, Pa., with a capital stock of $15,000, to manufacture washing machines, motors and household utensils. The incorporators are James H. Knoll, 1315 Good Street, Mary E. Knoll and John B. Mullen, all of Reading.

The United Novelty Company, Lancaster, Pa., has been incorporated with a capital of $10,000, to manufacture novelties, by Isidore Rosenthal, 138 East Clay Street, Lancaster, Pa.; Albert Rosenstein, Lancaster, and Edwin I. Rosenstein, Power Building, Chicago.

The Dudley Electrical & Machine Company, Uniontown, Pa., has been incorporated with a capital stock of $50,000, by W. E. Dudley, 104 East Main Street, Uniontown; Elwood D. Fulton, W. D. Woodriff, J. T. Dudley, Harry E. Street and Lucy Fulton. It will manufacture boilers castings and electrical machinery

Martin Foster & Son, manufacturers of aluminum, brass and copper castings, Altoona, Pa., recently erected a foundry at a cost of $700, not $5,000 as has been reported.

Industrial conditions at Lewistown, Pa., have improved greatly in recent months. The Standard Steel Works is operating at nearly full capacity. The Mann Edge Tool Company has a number of large orders which keep the plant working at capacity. The Keystone Motor Company has been forced to enlarge its automobile repair plant.

The Morton Crosby Company, Chester, Pa., has been incorporated with a capital of $15,000 to manufacture foundry and filter supplies. The incorporators are Crosby M. Black, Fifth and Madison Streets, Chester, Pa.; James A. Hinderhoffer, 210 Lloyd Street, and Edmund Rose, 1137 Potter Street, Chester, Pa.

The Allen Engineering Corporation has been granted a state charter. The capital is $10,000 and the incorporators are Thomas C. Allen, Glenside, Pa.; Edwin L. Brockway, Glenside, and Harry T. Rotenbury, 1351 Pike Street, Philadelphia.

The Reading Cycle Mfg. Company, Reading, Pa., has been organized with a capital of $5,000 to manufacture motorcycles, etc., by Keyser Fry, George Leinbach, L. R. Fry, Harry Adams and Walter L. Kerst, all of Reading.

C. L. Leiby, who recently withdrew from the firm of Leiby & Flurie, brick manufacturers, New Cumberland, Pa., and G. C. Landis, Brownsville, Pa., have formed a partnership to erect a brick plant of 50,000 bricks per day capacity. Machinery will be purchased.

George F. Eberhardt, proprietor of the Gettysburg Motor Garage, Gettysburg, Pa., will build a garage and repair shop of 150 cars capacity.

The American Dyewood Company, foot of Delaware Avenue, Chester, Pa., is said to be planning the construction of an additional mill for the manufacture of dyestuffs. T. C. Palmer has charge.

Harry Holcroft, Chester, Pa., will shortly start the erection of new furnaces at the former Roach shipyard, Chester.

The new buildings erected at the plant of the United Roofing Company, Marcus Hook, Pa., will soon be ready for the installation of machinery.

New England

BOSTON, MASS., Aug. 16, 1915.

The New England Westinghouse Company, Springfield, Mass., has purchased the plant of the Page-Storms Drop Forge Company, Chicopee, Mass., which is capitalized at $125,000. The factory, which has a working force of about 150 men, has been making tools for the Westinghouse Company for several weeks and also filling a small order for shrapnel parts. No announcement has been made as to what effect the transfer will have upon the Page-Storms organization.

Patrick E. Somers, manufacturer of tacks and nails, 35 Lagrange Street, Worcester, Mass., has awarded contract to Edward D. Ward, 82 Foster Street, for the construction of a fourth story, 36 x 141 ft., to its present factory. He will increase his working force and add new machinery.

H. R. Turner, superintendent of construction, 224 Broad Street, Windsor, Conn., will receive bids until Aug. 20 for furnishing electrically driven pumping equipment.

The American Brass Company, Waterbury, Conn., will demolish a factory building on Washington Avenue and erect a new one in its place.

The Remington Arms-Union Metallic Cartridge Company, Bridgeport, Conn., will erect a five-story brick factory, for which it has recently taken out a permit.

The Bridgeport Brass Company, Bridgeport, Conn., will build a brick foundry and a steel factory building.

The New England Westinghouse Company, Springfield, Mass., started the operation of its Meriden Arms Company plant, Meriden, Conn., on Aug. 9. It will remain under the management of John K. Williams, who managed it for Sears, Roebuck & Co., Chicago, Ill. The purchase price of the plant is said to have been over $500,000.

Landers, Frary & Clark, Meriden, Conn., are making arrangements to move the machinery in the Humason & Beckley plant on Washington Street to its main factory.

The Heald Machine Company, Worcester, Mass., manufacture of grinding machinery, has awarded contract to the Fiske-Carter Construction Company, 11 Foster Street, Worcester, for the erection of a machine shop, 160 x 200 ft., one story, of brick and concrete, to cost about $50,000. Some machinery will be added to the company's equipment.

The Sturtevant Aeroplane Company, Boston, Mass., has been incorporated by Noble Foss of the B. F. Sturtevant Company, Hyde Park, Boston, and others, to manufacture aeroplanes. It will occupy part of the former B. F. Sturtevant Company works at Jamaica Plain, Boston, comprising about 30,000 sq. ft. of floor space.

The United States Mfg. Company, Pawtucket, R. I., has been incorporated with a capital stock of $1,000,000 by Chauncey E. Heeler, Charles T. Sisson and Harold P. Swisbury, to manufacture war munitions. Nothing is known as to manufacturing plans.

The J. Wallace Mfg. Company, composed largely of New York capitalists, has leased the factory of Smith & Wallace, manufacturers of armature machinery, Woburn, Mass. It is reported that the company has received a contract for war supplies amounting to over $2,000,000, and will employ about 1,000 men in three shifts. It has already started upon the work with the present Smith & Wallace force of about 60 men. It is understood that a new factory will be started in about two months, inasmuch as the present plant was badly damaged by fire a few months ago and has not been repaired.

The Tubular Rivet & Stud Company, 87 Lincoln Street, Boston, Mass., will build a brick addition to its plant on Linden Street, Wollaston, 50 x 178 ft., to cost $12,000.

The Packard Motor Car Company, Detroit, Mich., has purchased a four-story brick and concrete service plant at Commonwealth Avenue and Malvern Street, Boston, valued at about $210,000.

Fay & Scott, Dexter, Me., manufacturers of engine and turning lathes, is building additions, 47 x 66 ft. one story, and 40 x 60 ft., two stories.

The Asa S. Cook Company, Hartford, Conn., builder of bolt-heading and woodscrew machinery, has purchased a site on Franklin Avenue and Goodrich Street and will build a factory. It is one of the companies which must vacate leased quarters in the west armory of the Colt's Patent Firearms Mfg. Company, Oct. 1.

The Spencer Wire Company, Spencer, Mass., is reported to be planning a new tinning mill.

The Mathews Mfg. Company, 104 Gold Street, Worcester, Mass., has received several good-sized orders for steel ferrules, said to be for export.

Baltimore

BALTIMORE, MD., Aug. 16, 1915.

Further details of the plans of the Bartlett-Hayward Company have been announced. The plant which will be built at Dundalk, Md., will include 22 buildings, 20 of which will be approximately 176 x 300 ft. A tool shop and an office building will each be 50 x 100 ft. The construction will be of steel and corrugated iron. Plans are being made for a pier. It is planned to ship the shrapnel directly from the plant to Europe. The erection of two additional buildings at the city plant of the company is announced, making the total five. These are a machine shop and a boiler house. Work on the addition to the present machine shop is well under way. J. Henry Miller, Inc., the contractor, is working three shifts of men on the improvements. The charter of the Bartlett-Hayward Company has been amended to permit the firm to manufacture steel, metals, etc.

The C. D. Pruden Company, Dock and Warner Streets, Baltimore, which has supplied a large number of aeroplane hangars and portable garages to Russia and England, is figuring on an order for portable storage houses for the French Government.

Another war order worth about $2,500,000 has been received by the Poole Engineering & Machine Company, Woodberry, Md.

Steps for the manufacture of brass sheet will be taken in the near future at the plant of the Baltimore Copper Smelting & Rolling Company, Fourth Avenue and Fifth Street, Canton, Md., according to William H. Peirce, the manager. It will mean the establishment of a brass plant with capacity of between 60,000 and 70,000 lb. per month. The details are being handled by the New York office.

Plans for an addition, 176 x 334 ft., to the fertilizer plant of the G. Ober & Sons Company, foot of Hull Street, Baltimore, will cost about $55,000. Part of the equipment has been bought. The company's office is in the United States Fidelity & Guaranty Building.

The Ansonia Copper & Brass Works, Cincinnati, are reported to have received an order for 250,000 lb. each of sheet copper and seamless copper tubing from the United States Industrial Alcohol Company, 27 William Street, New York City, for use in a proposed plant at Baltimore, Md. The distillery to be erected at Baltimore will consist of eight stills, four of which are to be completed immediately and the remaining four to be erected within one year. When completed the plant will contain five buildings and will be the largest of its kind in the world.

W. D. McLaughlin, 1500 North Charles Street, Baltimore, has awarded contract to McLaughlin Brothers, Inc., 915 Bolton Street, Baltimore, for a garage and automobile repair shop at Charles and Oliver Streets.

The William H. Roe Harvester Company, Hagerstown, Md., has been incorporated with a capital stock of $20,000 to manufacture a corn-harvesting machine. Negotiations for the lease of a factory are under way. The incorporators are Andrew K. Coffman, 29 West Franklin Street, Hagerstown; Mayberry I. Patterson, Charles F. Strole, William H. Roe, H. Lionel Meredith, Oscar D. Bower and Gorman S. Bussard.

A contract for the construction of an ironworking shop, one of the contemplated improvements at the plant of the Baltimore Dry Docks & Shipbuilding Company, Baltimore, has been awarded the Chesapeake Iron Works, Severn and Bayard Streets, Baltimore. It will cost about $100,000. The contract for a crane runner about 300 ft. long and 40 ft. high has been awarded the American Bridge Company, 600 Continental Building, Baltimore. The Brown Hoisting Machine Company, Cleveland, Ohio, has the contract for the crane. Orders for additional tools have been placed with the Emerson Company, Wilmington, Del. The company is rushed with orders.

Contractors have been asked to bid on the erection of a crane runway at the Mount Clare Shops of the Baltimore & Ohio Railroad, Baltimore.

A one-story addition, 16 x 31 ft., will be built to the plant of the Artillery Fuse Company, Wilmington, Del.

Work on plant No. 4 of the DuPont Powder Company, at Carney's Point, N. J., has been started and the building will be rushed to completion.

With a capital stock of $50,000, the Hopewell Electric Light & Power Company, Hopewell, Va., has been incorporated. C. T. Morris is secretary.

Plans to rebuild a boiler house recently destroyed by fire are being made by the Brinkley Lumber Company, Suffolk, Va.

The Virginia Smelting Works, Norfolk, Va., is said to be considering the construction of a plant for the manufacture of dye.

Plans for an addition to its plant are being considered by the Fletcher Enamel Company, Dunbar, W. Va.

The G. Ober & Sons Company, fertilizer manufacturer, United States Fidelity & Guaranty Building, Baltimore, plans improvements to its plant at the foot of Hull Street, to cost about $100,000 and including an addition 185 x 350 ft.

Leon Rasst, 1902 Eutaw Place, Baltimore, states that plans are being made to establish a large plant for the manufacture of guncotton and shrapnel for the Spanish-American Trading Company, Baltimore, recently incorporated in Delaware.

A contract for an addition, 38 x 153 ft., to the plant of the National Casket Company, East Falls Avenue and Lombard Street, Baltimore, has been awarded to the Charles L. Stockhausen Company, Marine Bank Building, Baltimore. It will cost about $15,000.

The Cambridge Wire Cloth Company, Cambridge, Md., has been incorporated with $6,000 capital stock by E. F. Pink, Cambridge, Robert Pink and Arthur B. Carle.

With capital stock of $10,000 the Phoebus Iron Works, Phoebus, Va., have been incorporated. W. C. L. Taliaferro is vice-president and J. M. Cumming, Hampton, Va., secretary-treasurer.

The J. D. Blackard Stave & Cooperage Company, Stuart, Va., plans to install additional machinery for the manufacture of slack barrel staves.

The Virginia Electric Welding Company, 900 Water Street, Norfolk, Va., has been incorporated with $15,000 capital stock. J. A. Ridgewell is president and Frederick Tonnemacher vice-president and general manager.

The Galax Ice & Cold Storage Corporation, Galax, Va., has been incorporated with $25,000 capital. E. B. Crabill is secretary.

Chicago

CHICAGO, ILL., Aug. 16, 1915.

Inquiry for tool equipment for the manufacture of war materials is unabated. In striking contrast, purely local business seems almost at the lowest possible notch. The Interstate Iron & Steel Company is in the market for some heavy engine lathes and other smaller tools. The demand for second-hand machinery completely outstrips the available supply and the volume of business is somewhat curtailed in consequence. Sales conditions generally with respect to machine tools, both as to prices and tools, are exceedingly unsettled and trading is in a degree unsatisfactory for that reason.

William Schukraft & Sons, Chicago, will build a four-story wagon factory, 100 ft. square, at Fulton and Sangamon Streets, to cost about $65,000. Froman & Jebsen are the architects.

D. J. Hauptman, 1307 City Hall Square Building, Chicago, will build a machine shop, 75 x 125 ft., at 1744 North Kolmar Avenue.

The Edmund T. Perkins Engineering Company, Chicago, is preparing plans for a one-story pumping station to be erected for the Lee County board of supervisors, Fort Madison, Iowa, at a cost of about $400,000.

The United States Ball Bearing Company, Chicago, will build a one-story brick factory, 243 x 282 ft., at 4535 Palmer Street.

Chatten & Hammond, Chicago, have prepared plans for the foundation of a one-story factory, 50 x 95 ft., to be erected for the Pure Carbonic Company, East St. Louis, Ill.

The Wheeling Corrugating Company, Chicago, has had plans prepared by Paul Gerhardt for a six-story warehouse, 200 x 300 ft., to be erected at Arthington Avenue and the Baltimore & Ohio Railroad. It will cost about $200,000.

The Solar Metal Products Company, manufacturer of hollow metal window sash and doors, Columbus, Ohio, which removed its business from Chicago, has started operations at its new plant at Third and Cleveland streets. Henry R. Gogay is vice-president and general manager.

Holabird & Roche have prepared plans for a three-story box factory, 41 x 116 ft., to be erected for the Republic Box Company at 913 to 931 North Halsted Street, Chicago, at a cost of about $25,000.

The Hukle Gas Engine Company, Joliet, Ill., has been incorporated with a capital stock of $50,000 by J. F. Carroll, F. O. Jacobs and Artie C. Carlson.

Rochester, Minn., is to build a municipal electric light plant to cost $110,000. Plans have also been completed for a power house for the city to cost $125,000.

The Campbell-Kelly Foundry, Tonopah, Nev., the largest machinery plant in southern Nevada, was totally destroyed by fire.

Chariton, Ia., is taking bids on a water works system to cost $80,000. M. G. Hall, Centerville, Iowa, is the engineer.

The Clearing Foundry Company, Chicago, has been organized with a capital of $6,000 by George W. Ray, S. Mendelson and George Kamp.

Indianapolis

INDIANAPOLIS, IND., Aug. 16, 1915.

The Thorn Railroad Tie Company, Indianapolis, has been incorporated with $80,000 capital stock to manufacture railroad ties. The directors are Lawrence T. Thorn, J. M. and I. M. Williams.

The Century Post Company, Indianapolis, incorporated with $5,000 capital stock, will manufacture concrete machinery. B. F. Crisenberry, H. N. and I. Elmore are the directors.

The Oakes Company, Indianapolis, manufacturer of automobile accessories, has increased its capital stock from $50,000 to $75,000. Warren D. Oakes, president.

The Hercules Concrete Machinery Company, Indianapolis, with which has been merged the Standard Tool Company, will move its plant to Shelbyville, Ind., and combine with the Jones Foundry Company. The new organization will have $60,000 capital stock. Charles H. Halt is president of the Hercules company.

The Lindberg Cutlery Company, Anderson, Ind., has been incorporated with $5,000 capital stock to manufacture cutlery. The directors are Fred Lindberg, William Vess and Charles A. Jackson.

The Fuhrman Auto Company, Fort Wayne, Ind., has been incorporated with $10,000 capital stock to manufacture automobiles. The directors are W. J. Fuhrman, George Dewald and Clifford Beall.

The Tell City Planing Mill Company, Tell City, Ind., has been incorporated with $40,000 capital stock by John M. Kreisle, president; M. J. Kreisle, vice-president and E. F. Kreisle, secretary-treasurer, to operate a planing mill.

The Dice Machine Company, Anderson, Ind., has been incorporated with $10,000 capital stock by T. Chandler Werle, Spencer M. Hickman and E. Fred Dice to manufacture engines and motors.

The Burnoil Engine Company, South Bend, Ind., has been incorporated with $50,000 capital stock to manufacture engines and other machinery. The directors are C. A. Ross, S. B. Pettingill and R. M. Hoid.

The Miller Show Case Company, Fort Wayne, Ind., has been incorporated with $10,000 capital stock to manufacture show cases. The directors are Martin, F. C. and H. Miller.

The Central Furniture Mfg. Company, Fort Wayne, Ind., has been incorporated with $10,000 capital stock to manufacture furniture. C. W. Sperry, H. R. Spurling and A. W. Spurling are the directors.

The American Rotary Valve Company, Chicago, formerly of Anderson, Ind., has changed its name to the Arvac Electric & Mfg. Company.

The American Rotary Valve Company, Anderson, Ind., is considering making an addition to its new foundry in order to take care of its rapidly increasing business.

The Co-operative Glass Company, North Vernon, Ind., is making extensive improvements to its plant.

Milwaukee

MILWAUKEE, WIS., Aug. 16, 1915.

On every hand there is new evidence of a return to normal conditions, and a summary of the reports coming from metal-working shops indicates that the improvement is being accelerated day after day. For the first time in more than two years an urgent demand has appeared for wood and metal pattern makers and not enough labor of this character is now available. Practically every metal-working establishment in Milwaukee County is working a night shift. The new demand is affecting almost every field of activity. Collections are improving gradually, but bankers are still charged with restricting loans almost unduly. In some quarters this situation meets commendation, inasmuch as undue expansion is thereby prevented and activities are compelled to grow at a reasonable rate.

The Sterling Wheel Company, 245 Oregon Street, Milwaukee, is building a shop at Eighth and Oklahoma Avenues, to be ready for occupancy Sept. 15. Only a small list of equipment will be purchased. W. M. S. Miller is president and general manager.

Articles of incorporation have been filed by the Wetmore Mechanical Laboratory Company, Milwaukee. The capital stock is $20,000 and the incorporators are C. P. Wetmore, M. J. Walsh and W. C. Sieker. Mr. Wetmore was superintendent of the Dial Cash Register Company, Milwaukee, now defunct; Mr. Walsh is president of the M. J. Walsh Machinery Company.

The Simple Gas Engine Company, Brainerd, Minn., which has moved to Ashland, Wis., has changed from a Minnesota to a Wisconsin corporation. Articles just filed give the capital stock at $10,000 and corporators include A. L. Freimersberger, C. A. Anderson and W. F. Thommes. The concern occupies the former plant of the Ski Mfg. Company at Ashland and its castings are made under contract with the Nelson Roen Foundry Company, Ashland. Mr. Anderson is general manager.

R. Roberts will build a garage at 835 National Avenue, Milwaukee, which will contain a small equipment for machine work.

Charles A. McCommons, Clinton, Wis., will erect a garage, 60 x 100 ft., which will be managed by H. A. Rowe.

Hartford, Wis., closed bids Aug. 17 for an 8 x 19 x 12 vacuum pump, complete.

In spite of the heavy demand for machine tools which the plant has experienced, the Milwaukee Machine Tool Company, Sixtieth Avenue and Mitchell Street, West Allis, Wis., is continuing the manufacture of small, high-speed gasoline motors for light cars and trucks. An addition is being completed to accommodate the increased business.

The Turbo Motor Devices Company, Milwaukee, Wis., has been organized with a capital of $30,000 by W. G. and Thomas Spencer, M. L. Fykse and I. M. Smith.

The Gisholt Machine Company, Madison, Wis., has started work on its new machine shop and storage house.

The Enterprise Iron Works, Milwaukee, Wis., have been reorganized by Robert Wettstein and Carl Broenen.

C. M. Conradson, Fond-du-Lac, Wis., has completed financial arrangements preparatory to manufacturing lathes and is now engaged in securing equipment.

Detroit

DETROIT, MICH., Aug 16, 1915.

The demand for machinery in this market is holding its own, a steady stream of single-tool orders, with here and there a purchase of a small group of tools, serving to make a very fair aggregate of business. Local automobile interests have been buying a considerable amount of equipment, but much of this business has been placed outside of this city. Inquiry is good and is coming from varied sources. The demand for second-hand machinery continues strong. Building operations are confined to the smaller class of structures.

Additional capital has been interested in the Detroit Battery Company, Detroit, which is now capitalized at $60,000, and additions to the plant and equipment are being planned. Sidney W. Elston is president.

The Kramer Governor Company, Detroit, has filed articles of incorporation with a capital stock of $100,000 to manufacture engines, machinery and metal products. The incorporators are J. W. Anderson and H. E. Billan, Detroit, and Max Gessler, Milwaukee.

The Detroit Weatherproof Body Company, Detroit, has been organized with $10,000 capital stock by Charles Wilson, R. W. Allen and Lawrence Moore. It will manufacture automobile tops and bodies.

The George C. Clark Metal Last Company, Mishawaka, Ind., will erect a branch factory at Windsor, across the river from Detroit. It will be 53 x 133 ft., and will cost about $8,500.

The American Duplex Steam Trap Company, Detroit, has incorporated its business under the same style with a capital stock of $50,000.

The Crown Fender Company, Ypsilanti, Mich., has increased its capital stock from $20,000 to $50,000. Its business is growing rapidly and a larger factory is being planned.

The Prescott Company, Menominee, Mich., will add a line of mine pumping machinery to its regular line of sawmill machinery.

The taxpayers of Stephenson, Mich., have voted in favor of bonding for $5,000 for an electric light plant.

The Crown Dump Box Company, Kalamazoo, Mich., has been incorporated with $50,000 capital stock by Okke Kline, Peter Boersma and W. Kilpatrick to manufacture a dump box for wagons.

William B. Heath, Ionia, Mich., has purchased the plant of the defunct Ramsay-Alton Mfg. Company, Portland, Mich., at receivers' sale. The plant is valued at about $75,000. It is stated that the company will be reorganized and will continue the manufacture of furniture.

Roy W. Houghten, Bay City, Mich., is establishing a small shipyard at that point for the building and repairing of wooden vessels.

The Stork Motor Company, Saginaw, Mich., manufacturer of marine engines, is planning the removal of its plant to Bay City and the increase of its capital stock from $25,000 to $50,000.

The Consumers Power Company is planning to immediately rebuild its power plant at Corunna, Mich., which was recently destroyed by fire.

The Detroit Creamery Company, Detroit, has purchased the property of the Clio Condensed Milk Company, Clio, Mich., and will rebuild its milk-condensing plant, recently burned with a loss of $20,000.

The Lloyd Mfg. Company, Menominee, Mich., has increased its capital stock from $400,000 to $500,000. A portion of the proceeds of the new stock will be used for the erection of buildings for the company's new furniture plant.

The E. J. Woodison Company, Detroit, Mich., has incorporated in Canada to manufacture its regular line of foundry facing, supplies, equipment, platers' and polishers' supplies and equipment, and not to carry on a general machine shop and foundry business, as has been reported. Charles H. Woodison, 376 Dufferin Street, Toronto, is manager.

The plant of the Consumers Power Company, Shiawasseetown, Mich., was totally destroyed by fire with a loss on building and machinery of $15,000.

The Wilson Foundry & Machine Company, Pontiac, Mich., will build a foundry and machine shop to double its present capacity.

Sparta, Mich., has voted $12,000 in bonds for the building of a municipal electric light plant.

Cincinnati

CINCINNATI, OHIO., Aug 16, 1915.

The demand for second-hand machine tools, especially lathes, was never as great as it is now. Dealers have scoured the country for lathes, and have bought many discarded machines, paying fancy prices for them. A local manufacturer recently sold a lathe that had been in use over ten years within $5 of the price originally paid for it. In spite of the urgent demand for lathes, prices on new machines have not been advanced to figures that would anything like conform to current reports. During the prolonged dull period before the outbreak of the war in Europe, prices on all kinds of machine tools were reduced to a considerable extent and figures quoted two years ago should not be used as a standard in measuring the advances recently made. The higher wages paid now offset to a considerable degree the higher prices named on machine tools of all kinds.

Automobile and auto-truck manufacturers have recently purchased a large number of machine tools, including lathes and milling machines. It is probable that if prompt deliveries could be made a much larger number of orders could be booked. The foreign demand is a little slower, but this is looked on as a temporary condition. The demand for shaping machines is improving. Quite a number of large orders for sugar machinery have been received lately from Cuba. Tool steels continue to advance, but deliveries on rush orders are being made promptly.

The Elmwood Castings Company, Elmwood Place, Cincinnati, has been reorganized and incorporated with a capital stock of $100,000. The officers of the company are: President, H. M. Ramp; vice-president, George Deems; secretary, Joseph Weber, and treasurer, Louis B. Weber. In addition to the plant in Elmwood it has leased the foundry of the Lane & Bodley Company at Bond Hill, and is now operating both foundries at full capacity. No extra equipment will be required at present.

The Kern Machine Tool Company, Hamilton, Ohio, has acquired the lathe patterns of the Von Wyck Machine Tool Company, Cincinnati, and is now engaged in the manufacture of lathes. Later on the company expects to put out a new lathe under its own name.

The American Tool Works Company, Cincinnati, is now using a part of the I. & E. Greenwald Company plant, 720 East Pearl Street, for manufacturing purposes. It is also using its warehouse on Broadway for assembling and finishing machine tools.

The Steubing Truck Company, Cincinnati, has been incorporated with $5,000 capital stock by Walter J. Steubing, L. Gill, William Bramkamp, I. Boeker and Clifford Osinger. It has fitted up a shop at 308-10 Walnut Street that will be used for the manufacture of a patented lift-truck.

Batavia, Ohio, will soon receive bids for a lighting and power plant.

Middletown, Ohio, will soon make a bond issue of $120,000 for a new waterworks system.

F. W. Andrews, Dayton, Ohio, is interested in a company to be incorporated for manufacturing small refrigerating plants. A factory building has already been secured.

The Rustler Mfg. Company, Springfield, Ohio, recently incorporated, is fitting up a plant in the factory of the Amer-

ican Concentrator Company, in which it will manufacture a sugar-beet harvesting-machine. R. A. Denniss is one of the principal incorporators.

Grimes & Thompson, contractors, Piqua, Ohio, have been awarded contract for an addition to the county power plant, 38 x 61 ft., one story, of brick construction.

The plant of the Melvin Brick & Tile Company, Washington Courthouse, Ohio, which was destroyed by fire Aug. 10, entailing a loss of $10,000, partially insured, it is understood will be rebuilt.

Cleveland

CLEVELAND, OHIO, Aug. 16, 1915.

At Defiance, Ohio, the Defiance Machine Works and the Defiance Screw Machine Products Company, both are working 24 hr. a day. Rapid progress is also being made there on the construction of the new American Steel Package Company factory.

The additions to the plant of the Willys-Overland Company, recently started at Toledo, Ohio, will add about twenty-three acres of floor space. They will include an office building, 63 x 273 ft., seven stories, of steel and tile construction: a main factory, 400 ft. square, five stories, containing 800,000 sq. ft. floor space, to be used for assembling, testing and finishing; an addition to the enameling department containing 3500 sq. ft. of floor space; an addition to the pattern shop, 83 x 100 ft., three stories; an addition to the dry kiln, 107 x 145 ft., two stories; reconstruction and enlargement of the original manufacturing buildings, adding 53,000 sq. ft. of floor space.

The Alliance Engineering Company, Alliance, Ohio, has been recently incorporated by interests connected with the Alliance Machine Company. The new company will erect a factory, 120 x 200 ft. It is reported that it will be devoted to the manufacture of lines related to those made by the machine company.

The Alliance Structural Company, Alliance, Ohio, will erect an addition 100 x 250 ft., to be devoted to heavy structural work.

The Alliance Gas & Power Company, Alliance, Ohio, contemplates the investment of about $57,000 in new buildings and equipment to increase the capacity of its power plant.

The Cleveland Ford Tire Company, Cleveland, Ohio, has purchased four acres of land at Ashtabula along the New York Central Railroad, foot of Benefit Street. D. H. Surgeon and E. A. Pearce represent the company.

The Garford Motor Truck Company, Lima, Ohio, is reported to have received more than $3,000,000 of business since Jan. 15. Of this $2,000,000 is stated to be for orders for export. The company is building an addition to cost about $20,000.

The Cook Buggy Company, Bloomville, Ohio, will remove to Fostoria and occupy the former Storm Buggy Company plant on East Center Street.

The Municipal Service Company, Land Title Building, Philadelphia, Pa., plans to take over the Salem Electric Light & Power Company, Salem, Ohio. It will incorporate in the State of Ohio and invest about $80,000 to erect another service plant similar to that of the Salem Company, and will install 60-cycle in place of 25-cycle motors.

The Canton Sheet Steel Company, Canton, Ohio, has awarded contract to the Canton Bridge Company for structural work for three new buildings, 140 x 150 ft., 140 x 350 ft., and 80 x 350 ft.

The Consolidated Mfg. Company, Dayton, Ohio, has purchased the former New Era Engine Company plant at Dale Avenue and the Panhandle Railway for the manufacture of specialties. The company was recently incorporated with a capital stock of $200,000 by C. A. Creighead, Joseph D. Chamberlain and E. P. Cummin. H. E. Talbott of the Dayton Metal Products Company, Frank T. Hoffman of the Davis Sewing Machine Company, A. E. Stevens of the Barney & Smith Car Company, I. E. Jones of the Brownell Company, and Nelson Emmons, Jr., of the Dayton Mfg. Company, are all stockholders.

The Brunt Tile & Porcelain Company, Columbus, Ohio, recently incorporated with a capital stock of $150,000, has completed its factory for the manufacture of floor and steel tile. G. F. Brunt, formerly of East Liverpool, Ohio, is president and J. A. Nagle is general manager.

F. W. Crofoot, 317 Fourth Street, S. W., Canton, Ohio, and others, plan the incorporation of a company with a capital stock of $130,000 to establish an artificial ice plant with a capacity of 75 tons a day.

The Toledo Plow Company, Toledo, Ohio, has sold its bobsled manufacturing business to the Turnbull Wagon Company, Toledo, Ohio, which will manufacture the bodsleds at its plant in Defiance, Ohio.

Efforts are being made to rehabilitate the business of the Browning Steam Shovel Company, Mansfield, Ohio. The company's affairs are now before the courts in Cleveland. The re-establishment of the business is being seconded by the local chamber of commerce.

C. D. Greenleaf, Wauseon, Ohio, has obtained the controlling interest in the business of C. G. Conn, Elkhart, Ind., manufacturer of clarinets, etc.

Plans have been completed for five factory buildings to be erected by the Goodyear Tire & Rubber Company, Akron, Ohio, including two seven stories, 59 x 176 ft., and 59 x 122 ft., one eight stories, 80 x 100 ft., a blacksmith shop, 37 x 80 ft., and a gasoline storage building.

The Novelty Stamping Company, Bellaire, Ohio, has moved its stamping department to its plant at Massillon.

The Gartland Toledo Foundry Company, Toledo, Ohio, has been incorporated with a capital stock of $80,000 by H. F. and T. H. Gartland, R. S. and W. L. Holbrook and John T. Haswell to manufacture gray-iron products. It will build a brick and steel plant, 100 x 430 ft., in Ironville upon a tract of 80 acres which it has recently purchased. A second plant will be started upon the completion of this. Plans for the building have been drawn by the Devore-McGormley Company, Toledo. The company has been doing considerable business with the Willys-Overland Company, and is moving to Toledo to facilitate its work and deliveries.

E. A. Crawford has been discharged as receiver of the McClurg Rubber Company, Coshocton, Ohio. The company is installing equipment and plans to start its plant within a very short time.

The Chandler Motor Car Company, 1105 Swetland Building, Cleveland, Ohio, has awarded contracts for three buildings, including a brick and concrete building, 110 x 402 ft., one story, to cost $50,000, a boilerhouse to cost $5,000 and a two-story brick office building to cost $15,000. Bolton & Pratt are the contractors.

The Templet Company, Ashtabula, Ohio, has been organized by H. B. Ash, and will manufacture cardboard templets.

Clarence J. Davis, East Palestine, Ohio, has purchased the plant of the Croxton Motor Car Company, Washington, Pa. He is said to represent a rubber tire manufacturer, but further details are unavailable.

The Standard Oil Company, 26 Broadway, New York, is making improvements to its plant at Conneaut, Ohio, to cost about $40,000. It will install high-power gasoline motors to operate its pumping equipment.

The plant of the Avery Stamping Company, 5207 Lakeside Avenue, Northeast, Cleveland, has been sold to the Moline Plow Company, Moline, Ill. The Cleveland Trust Company, trustee for the Avery Company, which has been in bankruptcy since May, 1914, has asked the referee to confirm the sale. The terms of the transfer include the disposal of all of the equipment and a lease on the plant with an option to purchase it within a year for $150,000. It will be put in operation on a 24-hr. schedule with a full force, to turn out an order for shrapnel worth about $12,000,000, which the purchaser is said to have secured.

It is stated that P. A. McHugh, West Third Street, Cleveland, manufacturer of chairs, etc., has closed a contract for 600,000 oak gunstocks for one of the Russian rifle contracts.

The Central South

LOUISVILLE, KY., Aug. 16, 1915.

While business the past week has been somewhat less active than for the period immediately preceding, prospects continue bright. Most of the jobs handled recently have been small, but larger work is now coming into the market. Machine shops continue to operate on a good schedule and with jobbing work above the average in quantity little fault is found with the situation. Electrical and steam power equipment are selling well, while wood-working machines are also in demand. Machine tools, including direct-connected motor-driven equipment, continue in good call.

Henry Brothers, Fourteenth and Maple Streets, Louisville, are to purchase equipment for the manufacture of steel refrigerators. Sheet metal-working machines will be needed.

The Churchill-Milton Lumber Company, Paul Jones Building, Louisville, suffered the loss of its New Albany planing-mill by fire recently. It will be replaced. A gasoline engine will probably supply the power.

The Mengel Box Company, Louisville, is reported unofficially to be considering the establishment of a paper mill to supply its paper box factory. H. P. Roberts is in charge.

The Illinois Leather Company, Fifteenth and Rowan Streets, Louisville, will install a freight elevator of 1500 lb. capacity. P. B. Cloud is buyer.

The Holly Ridge Lumber Company, Louisville, is equip-

...g a plant at Holly Ridge, La., for the manufacture of ...tary veneers. W. A. Watts is president.

The McHenry Mfg. & Machine Company, Hartford, Ky., ...arranging to make a specialty of automobile repair work.

The London Motor Car Company, London, Ky., is building ...garage. A repair shop will be equipped, and several ma...ine tools purchased.

William Brown and John Harris, Dixon, Ky., are pur...asing equipment for a blacksmith and machine shop.

The Cumberland Traction Company, Elizabethtown, Ky., ...as been organized to build an electric railway from Edmon...n to Hodgenville, Ky. It has $50,000 capitalization, and ...H. Greenup is promoting it.

J. H. McNeill, Decatur, Ala., and associates, have pur...hased the plant of the Memphis Cotton Oil Company, ...emphis, Tenn., and will install new equipment.

The Southern Engine & Boiler Works, Jackson, Tenn., ...eports that it is three weeks behind with its orders for gaso...ne engines, steam boilers and other power equipment.

The Tennessee Producers' Marble Company, Knoxville, ...enn., the plant of which was recently burned, has com...leted the erection of new mill buildings, and is purchasing ...one-cutting and finishing equipment.

The Standard Oil Company has begun the construction ...f an automobile garage at Chattanooga, Tenn., at a cost ...f $6,000. Some equipment for repair work will be installed.

The Tennessee Copper Company, 2 Rector Street, New ...ork, is considering increasing the capacity of its plant at ...ucktown, Tenn., for the manufacture of sulphuric acid. ...he report regarding the proposed enlargement, which is ...ased on a contract said to have been received from a ...oreign government, is thus far without official confirmation.

The John G. Duncan Company, 308 West Jackson Avenue, ...noxville, Tenn., is asking for prices on a rim jointer, spoke ...the and other wood-working equipment. A 12-hp. feed-...ater heater is also wanted.

The Tennessee Electric Railroad Company has been or...anized at Nashville, Tenn., with $50,000 capital stock by ...e Baker, William Myers, and others, and plans to build ...lectric railways 275 miles long.

Dayton, Tenn., will install a motor-driven pump at the ...aterworks plant to take the place of a steam boiler and ...ump which are now in use.

Birmingham

BIRMINGHAM, ALA., Aug. 16, 1915.

Further improvement in the machinery trade is reported, ...o much so as to justify real optimism for the first time in a ...ear. The machine tool demand cannot be filled. Cornmill ...upplies and ensilage cutters are on the active list. Boilers, ...ngines, both steam and gasoline, and pumps are selling ...reely. The feature of the trade is the resumption of all-...round activity, with rural districts and small factories ...eading.

S. H. Bollinger & Co., Shreveport, La., will build sawmill, ...planers, dry kilns, etc., at Silas, Ala., at an estimated cost of ...75,000.

The following cotton oil manufacturing companies have ...een incorporated in Atlanta, Ga.: the Bryson Cotton Oil ...Company, capital, $10,000, C. J. Murphy, Hughes Spalding ...nd others, incorporators; the Staple Oil Company, capital ...10,000, J. M. Volger, Dan McDouglad and others, incorpo...ators; the Wells Cotton Oil Company, capital $10,000, O. J. ...Milliken, F. W. McKee and others, incorporators; the Kelly ...Cotton Oil Company, capital $10,000, F. W. McKee, C. J. ...Murphy and J. M. Volger, incorporators; the Home Cotton ...Oil Company, capital $10,000, W. D. Street, O. J. Milliken ...nd others, incorporators.

The Compression Inner Tube Company, Atlanta, Ga., has ...een incorporated with a capital stock of $10,000 by S. A. ...Culbertson and others to manufacture automobile supplies.

The Rome Ice & Cold Storage Company, Rome, Ga., is ...being organized with a capital stock of $35,000 to establish ...a cold storage and refrigerating plant.

The Yaryan Rosin & Turpentine Company, Brunswick, ...Ga., has been incorporated by Albert Fendig, A. M. Wade and ...H. C. Smith, all of Brunswick; R. H. Bauer, St. Louis, and ...others, with a capital stock of $1,000,000. It will take over ...the assets of the Yaryan Naval Stores Company and the ...Empire Investment Company, aggregating $1,800,000, and ...prepare for the resumption of plant operation next fall.

The Black River Cypress Company, New Orleans, La., ...has been incorporated with a capital stock of $250,000 to ...construct a sawmill for the manufacture of cypress lumber ...at Sardinia, S. C. It will have an annual capacity of ...20,000,000 ft.

The Lightning Safety Vegetable & Fruit Machine Company, Bartow, Fla., has been incorporated with a capital stock of $40,000 to manufacture fruit and vegetable machinery. J. J. Boynton, J. B. Spencer and others are stockholders.

The Dixie Table & Mfg. Company, Atlanta, Ga., has been incorporated with a capital stock of $20,000 by T. L., M. B. and R. G. Young. It has purchased the fully equipped plant of the Young-Niall Company and will manufacture furniture.

St. Louis

ST. LOUIS, Mo., Aug 16, 1915.

Increased interest is shown in both metal-working and wood-working machinery. No lists of importance have appeared, but inquiry for single tools of all kinds and for second-hand tools is better. Money is easy and collections good. Altogether the first half of August presents a marked improvement over the period which has just preceded it. Although normal conditions have not yet been reached, seventy to seventy-five per cent is the general estimate of the volume of business done.

The Hafner Mfg. Company, St. Louis, Mo., will erect an addition to its wood-working plant at a cost of about $50,000.

The Pevely Dairy Company, St. Louis, Mo., will at once erect a main dairy plant to cost with equipment about $250,000. A large power plant will be included as well as separating and other special machinery of a total cost of about $100,000.

W. J. Holbrook, St. Louis, Mo., and other capitalists, are completing plans for large grain elevators, mechanically-operated loading systems, etc., in connection with river docks to be built for the operation of a barge and tow boat line on the Mississippi River.

The Marjory Stewart Mining Company, Joplin, Mo., has been incorporated with a capital stock of $25,000 by C. C. and George H. Playter, G. S. Bankard and W. B. Stewart and will install a 250-hp. gas engine, etc.

The Gate City Foundry Company, Kansas City, Mo., has been incorporated with a capital stock of $12,000 by William L. Karnes, T. J. Sheldon and N. D. Barr.

The St. Johns Levee & Drainage District, headquarters Charleston, Mo., will expend about $400,000 on a special levee for the protection of land on the Missouri shore. Special equipment for the work to cost about $50,000 is being sought.

The Rector Gas Heating Company, Kansas City, Mo., has been incorporated with a capital stock of $100,000 by George H. Opdyke, O. M. Edmonson and Paul W. Bradley.

The Killey-Carswell Mfg. Company, Kansas City, Mo., will manufacture metal culverts, road machinery and tools, etc. P. L. Killey is president.

The Peerless Burner & Machine Company, St. Louis, Mo., is to build a new plant which will cost $50,000.

The H. S. H. Mfg. Company, St. Louis, Mo., has been incorporated with a capital stock of $10,000 by Garrard Strode, Harry A. Hood and Philip G. Hoffman to manufacture automobile radiator caps.

The Weber Implement & Automobile Company, St. Louis, Mo., is building an addition to its plant.

The Oklahoma City Bridge & Construction Company, Oklahoma City, Okla., is in the market for equipment.

The Helena Ornamental & Press Brick Company, Helena, Ark., has been incorporated with a capital stock of $10,000 by W. V. Deering, W. F. Castle and Catherine Deering.

The Farmers' Gin Company, Cotton Plant, Ark., will install additional equipment, including three 70-saw gins and power machinery. J. M. McGowan is president.

The Mansfield Cotton Oil Company, Mansfield, Ark., has been incorporated with a capital stock of $30,000 by W. C. Hathaway, J. F. Rumsey and T. P. Edwards and will equip a cotton oil plant.

The Davenport Safety Tire Company, Little Rock, Ark., has been incorporated with a capital stock of $100,000 by J. R. Alexander, W. H. McLaughlin, and others.

Walnut Ridge, Ark., has authorized the creation of a waterworks and sewerage district, to be equipped at a cost of about $60,000. W. E. Beloate, W. M. Ponder and W. E. Lane are in charge.

The Muskogee Fruit Growers Canning Company, Muskogee, Okla., will operate a plant of about 40,000 cans daily capacity. Ralph Everett is manager, and O. P. M. Butler, president.

The Kusa Water & Light Company, Kusa, Okla., not a post office, has been incorporated with a capital stock of $10,000 by John F. Coshorn, Dewar, Okla.; George E. Nicholson, Kansas City, Mo., and Frank C. Nicholson, Iola, Kan., and is in the market for equipment. They have also incorporated the Kusa Lumber & Supply Company and will equip a sawmill.

The Simplex Gas Plants Company, Oklahoma City, Okla., has been incorporated with a capital stock of $125,000 by J. S. Wakefield, Oklahoma City and L. J. and O. G. Halliburton, Dallas, Tex., and will equip a foundry and machine plant for gas plant work.

Charles B. Parker, Tulsa, Okla., and others, as the Tulsa Engine & Foundry Company, incorporated with $50,000 capital, will manufacture engines, hay balers, ventilating machinery, etc.

The assembling plant of the Ford Motor Company, Detroit, Mich., to be equipped at Oklahoma City, Okla., will have an assembling floor, 135 x 200 ft., and a garage and repair shop of the same dimensions.

The factory of the Tulsa Boiler Mfg. Company, West Tulsa, Okla., has been burned with a loss of $75,000.

The city of Vicksburg, Miss., will add one low-lift unit to the city pumping plant. A. U. Paxton is city clerk.

The W. W. Carre Lumber Company's mill at New Orleans, La., which has been burned with a loss of $30,000 on equipment, will be replaced.

The Rhodes Metallic Packing Company, Shreveport, La., has been incorporated with a capital stock of $20,000 by A. C. Lea, Hampton P. Rhodes and James R. Russell and will equip a manufacturing plant.

The city of Argenta, Ark., will receive bids on two sewage pumps of 14,000-gal. per min. capacity, two 60-hp. motors and other equipment in connection with about $300,000 worth of sewer improvements.

The Rockwell Mfg. Company, Camden, Ark., has increased its capital stock from $50,000 to $100,000 and will enlarge its wood-working plant.

The Elk Lumber Company, Canton, Miss., has changed its name to the Stillwell Crosby Lumber Company and increased its capital from $80,000 to $200,000 for the purpose of increasing its mill capacity.

The Pacific Northwest

SEATTLE, WASH., Aug. 10, 1915.

A rumor is current that a large fleet of freight and passenger vessels will be placed in commission between Seattle and Vladivostock within the next four months, as a result of the tremendous commerce that has been built up between these ports. Increasing from $92,000 to $4,171,000 in the first six months of the present year, the amazing growth has compelled the attention of Eastern capitalists, who have sent agents to Vladivostock, Yokohama, Kobe, Shanghai, and other points to investigate and report on trade conditions.

The demand for miscellaneous machinery is slowly but steadily increasing. The progress of the grain harvest, with a large crop and a heavy export demand, is bringing a better feeling throughout the interior, with many orders for small power units and pumps for farm use. Grain-handling and milling equipment are both active. Mining and smelting interests are buying machinery freely, their purchases covering a wide range. A great deal of figuring is being done on various Alaskan developments, including that in connection with the Government Railway. Export trade continues active, and a number of new shipbuilding projects are coming up. Wood-working machinery, though still quiet, is receiving more interest.

The first cargo of government equipment from the Panama Canal Zone for use in the Alaska railroad work reached Puget Sound Aug. 4, the vessel stopping for bunker coal.

The Salmon Bay Foundry Company, Seattle, Wash., has been incorporated with a capital stock of $6,000 by John Wehn, S. Redick and others.

The Campbell-Kelly Foundry Company, Tonopah, Nev., which was completely destroyed by fire July 31, will be rebuilt immediately.

The Olympic Steel Works have been incorporated at Seattle, Wash., with a capital of $20,000 by C. W. Kucher and F. D. Moore.

G. W. Carr, S. L. Jones and others have organized the Irrigation Machinery Company, Seattle, Wash., with a capitalization of $50,000.

The plant of the Lang & Rodd Shingle Company at Chilliwack, B. C., was damaged by fire recently to the extent of $4,000. The drykiln was destroyed and a quantity of machinery damaged.

The plant of Clarke County Iron Works, Fifth and Harney Streets, Vancouver, Wash., was slightly damaged by a recent fire.

The City Council, Haily, Idaho, has granted to E. J. Gordon permission to construct a hot-water plant and distributing system to supply the city.

Harry Alldis, Chehalis, Wash., whose foundry and machine shop was completely destroyed by a recent fire, has leased a tract of land from the Northern Pacific Railway and will build another plant.

H. G. Fleischhauer, Centralia, Wash., has filed a bond for $10,000 to guarantee the erection of a powerhouse.

R. E. Shepherd, Hollister, Idaho, of the Hollister Townsite Company, will install a water system, including a motor-driven pumping station, etc.

The Weyerhauser Lumber Company, Everett, Wash., will replace boilers in its mill with new ones.

The Lee Mfg. Company, Helena, Mont., has filed articles of incorporation, with O. C. Lee and H. Lee, East Helena, and D. E. White, Helena, as incorporators. It will erect a plant for the manufacture of novelties, trunks, furniture, utensils, etc. It is incorporated for $50,000.

The Silverado Mining Company, Osborn, Idaho, will immediately purchase compressor equipment, and an electric power plant for immediate installation. C. D. Muxen, Spokane, is secretary.

The Mayflower Mining Company, Spokane, Wash., will be in the market for compressor equipment, etc. D. Scott Anderson is manager.

The Hubbard Mfg. & Development Company, Henry Building, Seattle, Wash., will erect a plant for the manufacture of a stump burner. W. R. Foley is president.

The plant of the J. A. Veness Lumber Company, Winlock, Wash., which was damaged to the extent of $175,000 by a recent fire, will be rebuilt immediately.

The Prairie City Light & Power Company, Canyon City, Ore., plans to extend its power plant. W. H. Burrell, a Portland capitalist, who is financing the dredging work in the John Day Valley, has given the company a contract amounting to $35,000 for power. A new plant, capable of developing 800 hp. will be built, and light and power lines constructed throughout the valley.

Texas

AUSTIN, TEX., Aug 14, 1915.

The drouth that was beginning to be severely felt in some portions of the State has been broken by good rains. The machinery and tool trade is holding up well. An encouraging view is taken of the Mexican situation and the reopening of the trade relations between the two countries is regarded as a probable outcome of the pending peace negotiations.

The Citizens' Gin & Power Company, Spur, will build a cotton gin and electric light plant. C. D. Copeland is in charge.

Jay Phillips, O'Donnell, will build a repair shop and garage.

The Devine Light, Power & Ice Company, Devine, which has been organized with a capital stock of $35,000, will build an electric light and power plant and an ice factory. J. W. Fullerton is a stockholder.

H. G. Bolson, New Caney, will build a lumber mill.

The American Timber Products Company, Houston, will build a plant for manufacturing timber products. John R. Cheek is a stockholder.

Jackson & Harmon, Alpine, will install a pumping plant.

Dexter, N. M., will award contract soon for pumping machinery and other equipment for its new waterworks system.

At a recent meeting of the board of directors of the San Antonio Belt & Terminal Company held at San Antonio a resolution was adopted formally accepting the 25-year franchise which the city commission had granted the company for the construction of a system of terminal railways and new passenger and freight stations. The proposed improvements will cost about $1,200,000.

The Royse City Ice & Electric Company, Royse City, Tex., will build an electric light and ice plant to cost $16,000.

Canada

TORONTO, Aug. 16, 1915.

The George Frid Brick Company, Ltd., Hamilton, has been incorporated with a capital stock of $40,000 to manufacture brick, tile, pottery, etc. The directors of the company are Margaret J. Frid, James A. Forrest, John E. Frid, manager, and others.

The C. A. Spencer, Ltd., Montreal, has been incorporated with a capital stock of $150,000 by Alexander H. Duff, Walter A. Merrill, Philippe Marchand, and others, to manufacture lumber, etc.

The Ideal Canning, Ltd., Ste. Dorothee, Que., has been incorporated with a capital stock of $50,000 by Eugene Bourgeois and Joseph Cousineau, Ste. Dorothee; J. E. A.

celles, Montreal, and others, to manufacture barrels, xes, etc.

Gourlay, Winter & Leeming, Ltd., Toronto, has been incorporated with a capital stock of $1,000,000 by Robert S. ourlay, 188 Yonge Street; Walter R. Winter, 104 Hilton venue; Edward A. Breckenbridge, 217 Rusholme Road, and hers, to manufacture musical instruments.

The Montreal Motor, Ltd., Montreal, has been incorporated ith a capital stock of $75,000 by L. E. A. D. Mailhiot, dward C. Baker, Samuel B. Holmes, and others of Montreal, manufacture corrugated steel pipes, agricultural implements, shells, etc.

La Foundrie de Victoriaville, Ltd., Victoriaville, Que., has een incorporated with a capital stock of $49,000 by A. roulx and others to manufacture iron, steel, machinery, etc.

The Dunlop Tire & Rubber Company, Booth Avenue, oronto, will build a three-story brick addition to its factory o cost $30,000. J. Westren is general manager.

The Doty Engine Company, Goderich, Ont., has received n order for the manufacture of shells.

The Norwood Engineering Company, Ltd., Cowansville, ue., is erecting a plant for the manufacture of shells and mmunition.

The Frost & Wood Company, Smith Falls, Ont., will inall $25,000 worth of machinery in its plant for the manufacture of shells, etc.

The J. C. Wilson Company, Glenora, Ont., will purchase achinery for the manufacture of war munitions.

McNeil Brothers, New Glasgow, N. S., will spend $75,000 n equipment for its plant.

The board of control, Montreal, will spend $900,000 on an ddition to its mechanical filtration plant.

Another addition is being made to the plant of the Ford otor Car Company, Ford, Ont., to cost $60,000.

The Galt Machine Screw Company, Ltd., Galt, Ont., will ommence shortly the construction of a plant there.

The Chevrolet Motor Company, New York City, has purhased a building at Toronto, and will install machinery nd equipment.

Egremont Township, Ont., will build an electric light lant to cost $3,000. David Allan, Holstein, Ont., is clerk.

E. R. Reid, Minto Hotel, Moncton, N. B., is in the market or a planing machine with calking knives and a 75-ton tandard gauge engine.

J. H. Morine et Fils, Trois Pistoles, Que., is asking for rices and information about steel, metal lath, screens, hot ater boilers and wood-working machinery.

H. A. Brochu, 294 St. Catharines Street, East, Montreal, asking for information and prices on wood-working machinery, etc.

The City Council, Chatham, Ont., will purchase new pumps or its waterworks plant with a capacity of 2,000,000 and ,000,000 gal. per 24-hr. day each. One of these pumps is o be a turbine, changeable from electricity to steam. The ew pumps will cost $3,000. William Gordon and Stewart amont are water commissioners.

Josie & McLeod, 49 Gertie Street, Winnipeg, is receiving rice and catalogues on hot water boilers, black, galvanized nd cast iron pipes; hydraulic pumps, cast and galvanized ron fittings, etc.

The Saskatchewan Co-operative Elevator Company, Reina, Sask., will build fourteen elevators in Saskatchewan his year.

The Ford Motor Company, Winnipeg, will call for tenders t once for the construction of a four-story building on ortage Avenue.

The Chesley Chair Company, Ltd., Chesley, Ont., is in he market for a direct-current dynamo.

Ottawa will spend $100,000 on the construction of an attoir and $50,000 on an incinerator plant.

The E. J. Ellis Lumber Company, Ltd., Wynyard, Sask., as been incorporated with a capital stock of $100,000 to anufacture lumber, etc.

The Spirit River Lumber Company, Ltd., Spirit River, lberta, has been incorporated with a capital stock of $20,000 manufacture lumber, etc.

The plant of the Hunter Bridge & Boiler Company, Kingardine, Ont., was completely destroyed by fire. The company was about to stant manufacturing shells. Patterns of the special machinery being installed were destroyed as well as a large amount of other valuable machinery. The loss will amount to $20,000.

The Whitman & Barnes Mfg. Company, St. Catharines, Ont., will soon begin work on an addition to its plant for the manufacture of tools.

The McKinnon Sash & Metal Works, St. Catharines, Ont., are building an addition to their plant to replace the foundry recently damaged by fire.

A plant for the smelting of zinc ore is to be established at Welland, Ont., by the Canadian Zinc Company, which is to be incorporated with a capital stock of $500,000. The plant of the Quality Beds Company, on the Grand Trunk Railway, has been leased for the purpose for two and a half years with the option of purchase. The Weedon Mining Company, Sherbrooke, Que., which owns large zinc deposits on the north shore of the St. Lawrence River, is behind the venture. The ore will be smelted by electricity and the new company is now arranging with the Hydro-Electric Commission for 4000 hp. It is stated that the industry is started practically at the command of the Dominion Government. The shortage and high price of zinc have become a serious menace to the munitions industry in which it is largely used.

Plans are beng completed for the construction of a sewage disposal plant and a pumping station at Mimico, Ont., estimated to cost $50,000.

Government Purchases

WASHINGTON, D. C., Aug. 16, 1915.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Sept. 7, schedule 8688, one belt-driven planing machine for Washington; until Sept. 14, schedule 8664, for twenty-seven motors for aeroplanes for Washington, Pensacola, or f.o.b. works; schedule 8659, for two direct-current turbo-generating sets for Mare Island.

The lighthouse inspector, Milwaukee, Wis., will receive sealed proposals until 2 p. m., Aug. 25, for furnishing two motor-driven air compressors.

Barstow & Co. to Push Construction Engineering

W. S. Barstow & Co., Inc., 50 Pine Street, New York, has reorganized its department of construction engineering, with Arthur M. Torrey, formerly with Hildreth & Co., New York, in charge. In the past seven years less attention has been given the construction engineering department than formerly, though the company never retired from the field, but it has gone extensively into the ownership and management of public utilities, of which it now controls about forty in the Eastern and Middle Western States. In connection with the reorganized construction engineering department the company has instituted an industrial bureau for the purpose of assisting in developing industries in the communities where it controls utility properties. Working arrangements have been made with the local chambers of commerce and a co-operative plan of locating industries is being worked out.

How a rapid reproduction of large numbers of blueprints was recently achieved is told by the Cincinnati Photoprint Company, Cincinnati. It appears that a manufacturer received a rush order from France. Accompanying the order were 147 blueprints. As three copies of each print were necessary for the different departments of the manufacturer, it is said that the company was on the point of refusing the order, owing to difficulty in meeting the contract time stipulations. It was calculated that some three weeks would be required to redraw, at a cost of $400. Instead each blueprint was reproduced twice by the photostat process and all of them delivered in 48 hr. time and at a cost below $100. Many of the blueprints were reduced to 13 x 18 in. in size, which was found convenient as well as legible, and the reproduction process, of course was an insurance against errors in re-drafting.

The graduation exercises of the Ranken Trade School, St. Louis, held July 23, were accompanied by the presentation of 69 diplomas, the largest number awarded by the school since its inception. Students who had completed the required courses of study and work comprised 3 plumbers, 10 carpenters, 3 painters, 8 pattern makers, 2 steam engineers, 12 machinists, 16 electricians and 15 apprentices in the co-operative class which is conducted by the school and by local plants in conjunction. The exercises were witnessed by more than 800 guests and the chief speaker of the evening was Clarence H. Howard, president Commonwealth Steel Company.

NEW TRADE PUBLICATIONS

Power Plant Oil Filter.—Richardson-Phenix Company, Milwaukee, Wis. Bulletin No. 10. Mentions a power plant oil filter, which was illustrated in THE IRON AGE, April 15, 1915, and the accessory apparatus for central oiling systems. The construction of the filter is gone into at some length, the text being supplemented by a number of line and halftone engravings. The use of the filter in connection with turbines and various other prime movers is touched upon and a typical central oiling and filtering system is described. Mention is also made of accessories such as oil storage reservoirs, pumps and level gages. A number of views of plants in which the filters have been installed are included.

Iron and Steel Sheets.—Stark Rolling Mill Company, Canton, Ohio. Pamphlet entitled, "Corrosion—The Cause—The Effect—The Remedy." Devoted to the use of iron and steel sheets for various purposes. The first section is historical and treats of the development of metal sheets and the progress that has been made along the lines of rust prevention. The second section gives comparative tests of Toncan metal and a few typical installations, while section three is a sheet manual for the architect, buyer, builder, seller and sheet metal contractor. This last section contains tables of weights and sizes, instructions for estimating and applying metal sheets, roofing and siding and other metal products of the company. Illustrations of these products are given and there are a number of views of the different products in use.

Piston Rings.—Burd High Compression Ring Company, Rockford, Ill. Pamphlet. Contains a complete directory of the various sizes and styles of piston rings that can be furnished either as stock sizes or on special orders. The directory contains a code word for each size of piston ring with data on the size of the ring, the make of engine on which it is used and the number of rings required per piston. This directory covers some ninety pages measuring 4 x 6¾ in. and is followed by a brief description of the construction of the rings which have the opening closed by a metallic guard without the use of springs. Instructions for installing the rings are given, the text being supplemented by a number of engravings. An alphabetical index of the various engines for which rings can be supplied is included, together with a number of tables of useful information.

Firebrick.—Elk Fire Brick Company, St. Marys, Pa. Pamphlet entitled "Refractory Efficiency Engineering." Contains a discussion of the use and manufacture of firebrick and other refractories, including the various steps in the manufacture of the brick and the different processes employed. This occupies twenty-two pages or half the booklet, the remainder being given over to a brief description of the equipment of the company for the production of various kinds of firebrick and illustrations of the various shapes that can be supplied. A number of tables of useful information are included.

Pipe Unions.—Jefferson Union Company, Lexington, Mass. Catalog A. Illustrates and describes a line of unions, union pipe fittings and flange unions having a spherical ground brass-to-iron joint which eliminates the use of gaskets. The various types of unions are illustrated and described and a number of dimension drawings and tables are included. Views showing different steps in the process of manufacturing the unions are included together with a number of suggestions on the securing of satisfactory service.

Fireproof Doors and Windows.—Riester & Thesmacher Company, 1512 West Twenty-fifth Street, Cleveland, Ohio. Catalogs D and E. The first describes and illustrates a line of windows constructed of hollow metal trim with wire glass, fire doors for use in brick fire walls and fire shutters. The general construction of the doors and windows is gone into at some length and a short statement of what is meant by the supervision of the Underwriters Laboratories and brief instructions for ordering doors and windows are included. The second catalog pertains to the various types of interior metal doors and fireproof partitions that can be supplied. Illustrations of the various standard types of doors are presented with a brief description of each. Mention is made of the fire tests to which these doors are subjected and a number of line drawings show the ways in which the various doors are installed. Drawings of the different types of moldings that can be furnished for the doors are included.

Expanded Metal.—Corrugated Bar Company, 499 Mutual Life Building, Buffalo, N. Y. Catalog. Describes Corr-Mesh, which is a stiff ribbed expanded metal designed for the construction of partitions, floor and roof slabs, walls for factory buildings, fences, etc. The various uses of the material are touched upon and details, specifications, construction photographs and instructions for using it are included. The different tools and specialties used with the expanded metal are illustrated and briefly described and mention is made of line of waterproofing products that can be supplied.

Steel Plate Exhaust Fans.—American Blower Company Detroit, Mich. Bulletin No. 6—series 2, superseding No. 6 series 1. Illustrates and describes a line of steel plate exhaust fans which are made in several different types handling shavings, dust, refuse or any heavy material that will not be injured by passing through the fan, as well as for cotton gin work and exhausting air, gas or light dust or warm material. The construction of the different types of fans gone into at some length, the text being supplemented by number of halftone engravings of the various parts. Capacity and dimension tables are given and a number of typical applications are shown. Instructions on the installation and piping of these fans are presented together with a number of tables of useful information.

Shell Painting Machine.—Canadian Fairbanks-Morse Co., Ltd., Bloor Street, West, Toronto, Canada. Circular. Refers to a special machine for applying paint to shrapnel shells which are spun during the time they are in the machine to facilitate the application of the paint and also the drying. Illustrations of the machine, which is mounted on wheels so that it can be taken around the plant, and of the machine in use are presented. An illustrated description of this machine appeared in THE IRON AGE, April 8, 1915.

Reinforced Concrete Construction.—Turner Construction Company, 11 Broadway, New York City. Pamphlet. Aims to give an indication of the service that has been rendered by this company in the construction of reinforced concrete factory buildings. A brief statement of the volume of work handled is given showing the percentage of repeat contracts. This is followed by a number of views of typical reinforced concrete structures with brief descriptions of these. These include warehouses, factories for various industries and terminal and loft buildings and a number of views of the interior flat slab construction used are presented.

Motor Cars.—McKeen Motor Car Company, Omaha, Neb. Pamphlet. Calls attention to the two latest types of motor equipment that have been turned out. These are a 70-ft. railroad postoffice, express, baggage and power car which pulls a steel railroad coach as a trailer and a highway coach which follows the same general lines as the motor cars that have been built for some time. Illustrations of the power car, which is equipped with a 300-hp. engine, and the highway coach are given as well as views of the first motor car that was built and some of the other railroad equipment that has been furnished.

Iron Railings.—J. W. Fiske Iron Works, 78 Park Place, New York City. Catalog. Size, 8 x 10½ in.; pages, This is the company's 1915 catalog describing and illustrating a line of wrought-iron railings, entrance gates and fencing for industrial plants, railroad rights-of-way, country estates, etc. Outside lighting fixtures, mesh wire work, tool and stockroom enclosures and ornamental iron work are also shown. Practically all of the illustrations in the catalog show the railing, gates and fencing in place, although there are a few views of the material itself.

Black Pipe.—A. M. Byers Company, Pittsburgh, Folder No. 307 entitled "Byers' Black Pipe." Contains a of questions and answers dealing with a comparison between the comparative service and cost of galvanized steel and black wrought-iron pipe. The illustrations show the resistance to corrosion of wrought-iron pipe and the way in which galvanized steel pipe has rusted out in a number of cases.

Turbo-Generators.—Kerr Turbine Company, Wellsville, N. Y. Bulletin No. 54. Details the advantages of turbine driven generators of large and small sizes and shows a number of installations and views of the sets themselves. A comparison of the amount of space required by a 200-kw. generator driven by high-speed and tandem compound reciprocating engines and a steam turbine is given the difference in the size of the foundations required, this being particularly noticeable in the amount of floor space. The various features of the turbo-generator sets such as low steam consumption, small floor space, simplicity of operation and close regulation are touched upon and a comparison of the cost of supplying current with oil, gas and steam engines and a steam turbine as the prime mover is presented.

Upright Power Hammers.—E. R. Caldwell & Co., Bradford, Pa. Special circular No. 46. Gives illustrations and a brief description of an upright power hammer with spring connection and adjustment for use in forging steel and copper. One of the features upon which special emphasis is laid is the connection between the frame and face wheel for varying the length of stroke. Both leather and metal spring connections are used, the former being recommended where a force of less than 150 lb. is required while the latter is designed for 200 lb. and over. A specification table, some testimonials and a partial list of users are included.